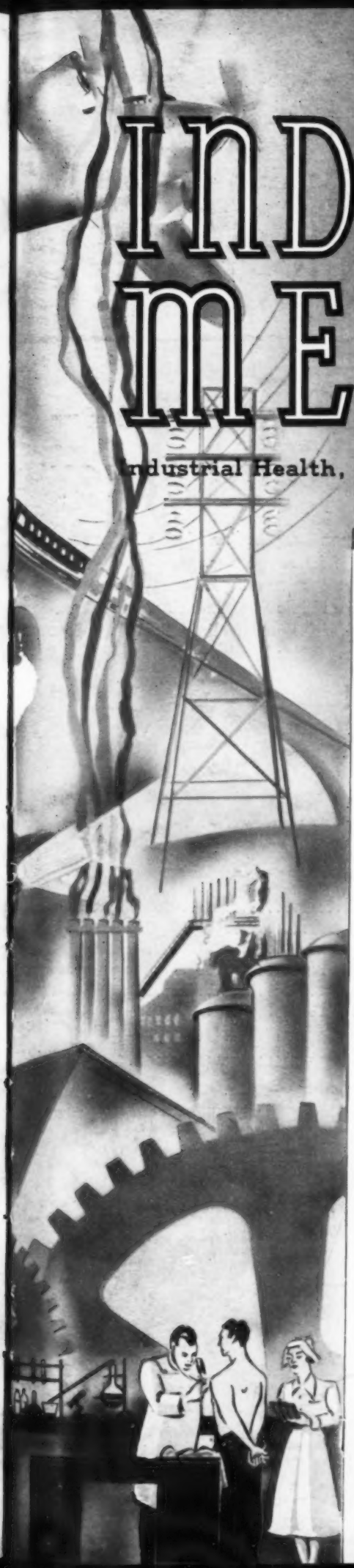

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Industrial Health, Occupational Diseases and Traumatic Surgery

August, 1942

Periodic Health Examinations
— Important Findings among Garment Workers —

Dermatitis
— Among Operators of Air-Conditioning Apparatus —

Industrial Man Hours
— How Caterpillar Conserves Them —

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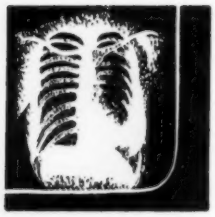

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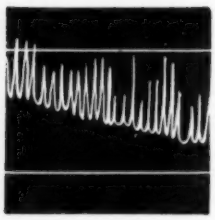

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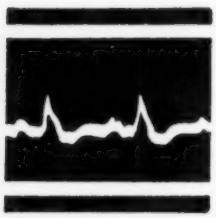

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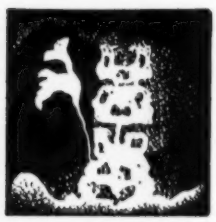

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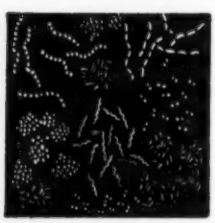

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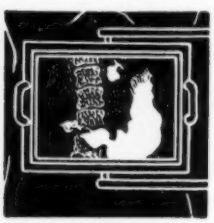

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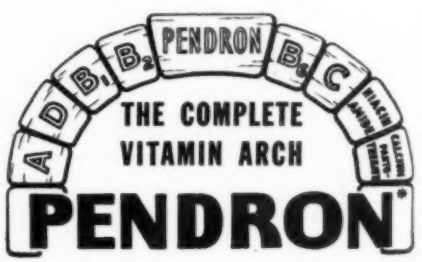

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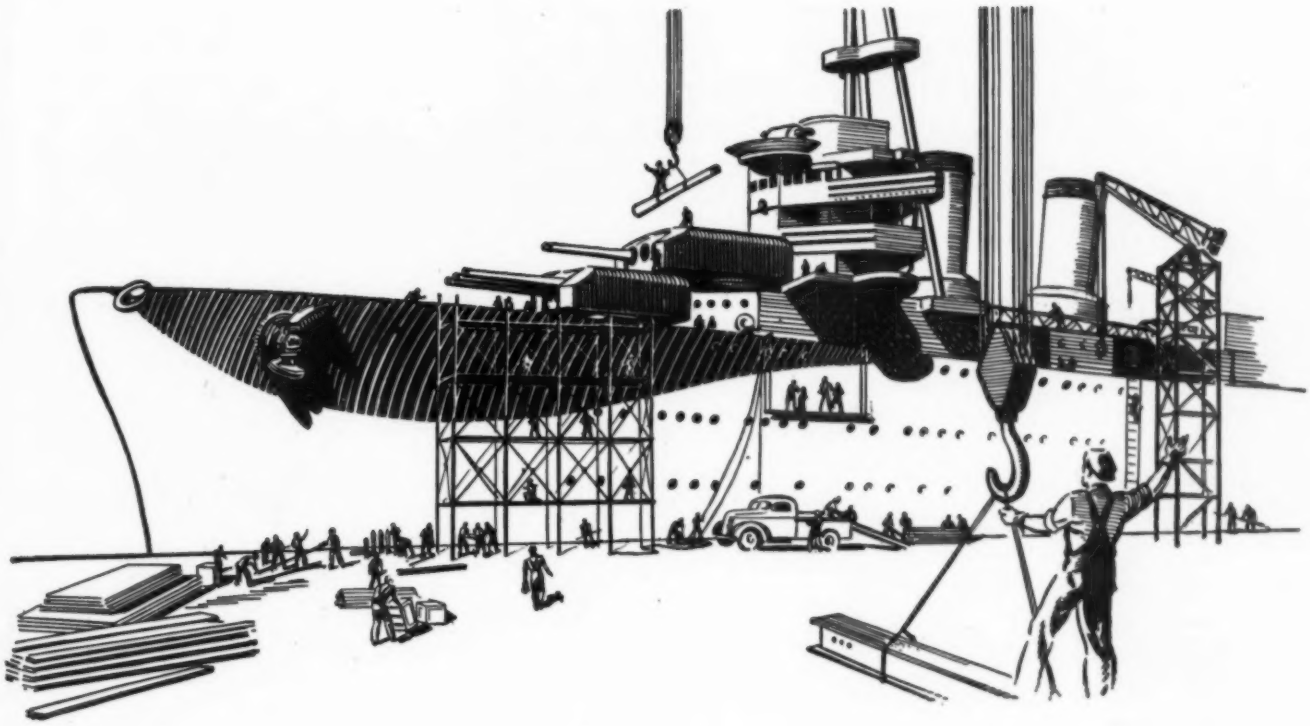

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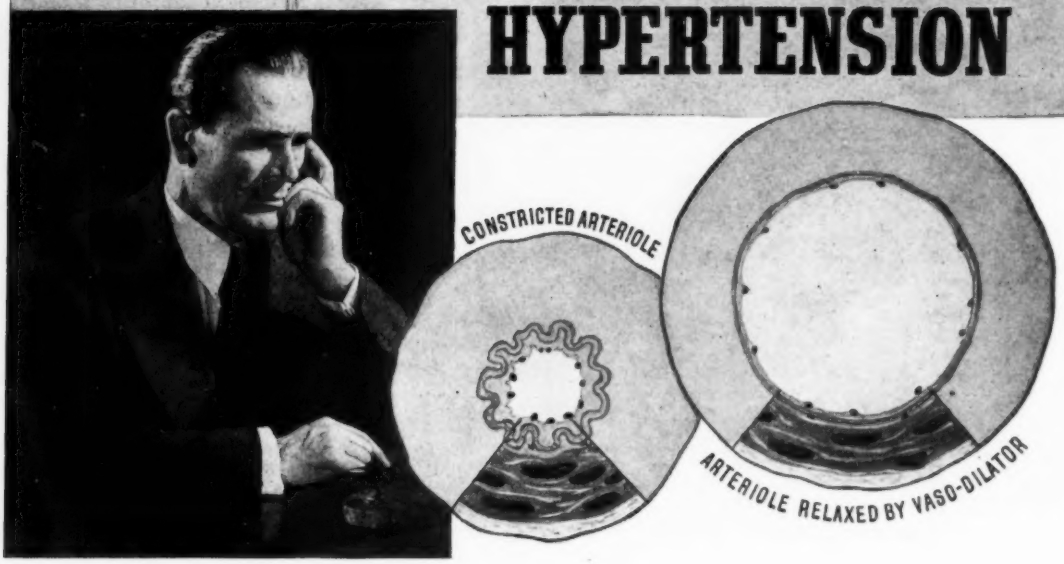

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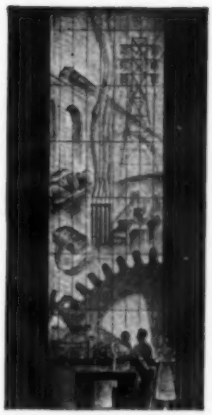

INDUSTRIAL HYGIENE
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& RAILROAD SURGERY

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DERMATITIS is more or less the predominant subject of this issue. But "something new has been added"; *something is being done about it* . . . WHATEVER the outcome of the proposed governmental labor pool mentioned on page 386, DR. BIRAM must be given the credit for an original and valuable suggestion—contained in his article on "Skin Sensitivity" (page 385). This and its accompanying "news-item" background are extremely interesting. A nice feature of his suggestion is that it can be acted upon by industries in the same community as effectively without as with the aid of government agencies. Personnel men can help—if they are so minded. The general subject is developed in further detail in DR. GALLIVAN'S contribution to *Connecticut Industry* (page 397) . . . DR. PRICE comments that the medical service program of the Union Health Center (page 369) "may be actuarially unsound." In view of its fine accomplishments, this is fortunate; if it were to be too "actuarial" it would miss the point . . . THE AMERICAN ASSOCIATION OF RAILWAY SURGEONS has called off its Fifty-Third Annual meeting, scheduled for September of this year (page 387). With another superlative program coming up, and a larger and more interesting group of exhibitors than ever, this was not an easy decision for the Executive Board. But we are at war . . . DR. VONACHEN'S brief account of Caterpillar's Medical Services (page 381) recalls his "Syphilis in Industry" (INDUSTRIAL MEDICINE, July, 1938) which touched off the movement toward the wise administration of syphilis control programs which has now become the national policy . . .

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DR. AARON S. LEVEN, of Chicago, entered Army service on July 5, reporting for duty at Picatinny Arsenal, Dover, New Jersey, as CAPTAIN LEVEN.

DR. WILLIAM M. LEES, associated with DR. ARKELL M. VAUGHN, in his industrial practice at 559 West 31st Street, Chicago, has gone into active military service.

DR. M. H. KRONENBERG, Chief of the Division of Industrial Hygiene, Illinois Department of Health, presented "The Problem of Nutrition in Industry" at the Illinois Conference on Nutrition for Defense at Springfield, June 19-20, 1942.

DR. J. DUANE MILLER, Secretary-Treasurer of the MICHIGAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Grand Rapids, has been called to active service as Lieutenant-Commander, Naval Hospital, Mare Island, California. DR. A. L. BROOKS, Medical Director, Fisher Body, Detroit, will act as Secretary-Treasurer of the Michigan Association during DR. MILLER'S absence.

DR. H. G. GARDINER, formerly associated with DR. G. N. BEECHER, 175 West Jackson Boulevard, Chicago, in the practice of industrial medicine and surgery, has been appointed full-time Medical Director at Foote Bros. Gear and Machine Corporation, 4545 South Western Avenue, Chicago. A new plant will be erected at 52nd Street and Western Avenue, and a medical set-up will be placed there. At present the company has about 2,000 employees; it is expected that this number will shortly increase to 6,000.

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DR. MICHAEL LAKE, long identified with the Medical Department of R. H. Macey & Co., Inc., New York, is senior author of "Arteriosclerosis and Varicose Veins: Occupational Activities and Other Factors — a study of 536 persons, divided into age groups, who had been sitting, standing or walking stairs for 10 years or more at their work," in *J.A.M.A.*, June 27, 1942.

MARION F. TRICE, Raleigh, North Carolina, was chosen Chairman of the National Conference of Industrial Hygienists at its meeting in Washington, D. C., April 10. DR. PAUL A. BREHM, Madison, Wisconsin, was named Vice-Chairman, and MR. J. J. BLOOMFIELD, Bethesda, Maryland, Secretary-Treasurer. The next meeting will be held in Washington, dates to be announced later.

DR. GEORGE S. STEVENSON, of New York City, active worker in mental hygiene, was recently elected president of the National Health Council, which is a clearing house for 18 national voluntary organizations promoting a better specialized library for the use of its member agencies and individual research workers.

DR. MEYER BROWN, Consultant for the Safety Zone Industrial Welfare program, has prepared an excellent monograph on "Industrial Fatigue." In this DR. BROWN has drawn upon his practical experience in industrial medicine and his extensive study and coordination of the reports and conclusions of industrial experts. The result is a complete, concise and authoritative

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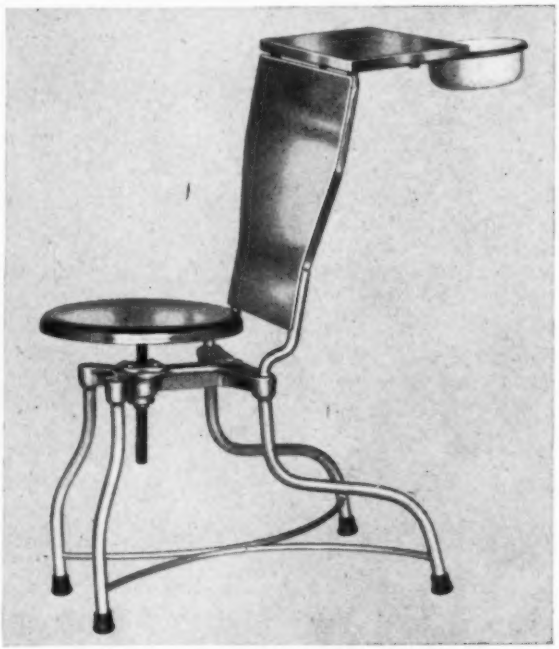

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DR. ALICE HAMILTON, 73, "industrial expert and first woman professor at Harvard," and YANDELL HENDERSON, 69, of Yale, inventor of the modern gas mask, were given honorary degrees in medicine early in June at Connecticut State Medical Society's sesquicentennial celebration. TIME, June 15, 1942, says of them as follows: "For 30 years Alice Hamilton has studied the ill effects of industrial poisons (lead in the paint trades, toluene in TNT plants, carbon monoxide in steel mills, benzol in airplane "dopes"), in 1924 published a modern classic, *Industrial Poisons in the U. S.* She also engaged in many a bitter fight to force her scientific findings on an indifferent public. Today Alice Hamilton looks back with satisfaction over the vast progress of the last 30 years. Clinical knowledge, new protective devices and a feeling of social responsibility among employers have greatly reduced industrial poison-

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—From *New Orleans M. & S. J.*, June, 1942.

DRS. JAMES E. REEDER, Chairman, C. H. CRETZMEYER and J. G. MACRAE, in *J. Iowa* State Med. Soc., July, 1942, report on the activities of the Iowa Committee on Industrial Health: "Since about the first of June the Committee on Industrial Health has been very busy, with the coordination of the Speakers Bureau and the State Department of Health, in a program on industrial health. Through a Federal grant the State Department of Health was able to promote an educational campaign throughout the state, particularly in the industrialized counties. Up to December 2, 1941, nine refresher courses or institutes were held in the following cities: Burlington, Cedar Rapids, Mason City, Sioux

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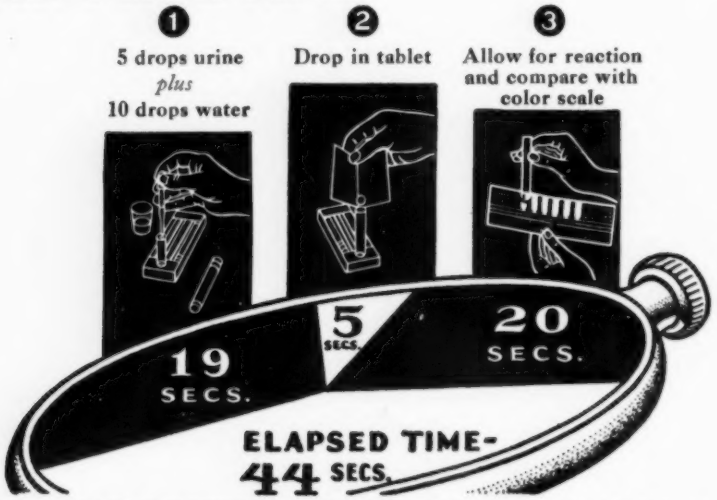
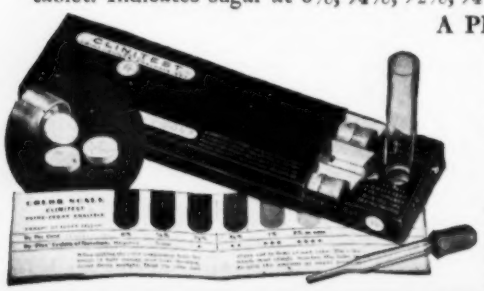


DEPENDABLE RESULTS—CLINITEST Tablet Method is based on same chemical principles involved in Benedict's test—*except*—no external heating required, and active ingredients for test contained in a single tablet. Indicates sugar at 0%, ¼%, ½%, ¾%, 1% and 2% plus.



A PRACTICAL ECONOMY—Complete set (with tablets for 50 tests) costs your patient only $1.25. Tablet Refill (for 75 tests)—$1.25.

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CLINITEST Urine-Sugar Test and CLINITEST Tablet Refill are available through your prescription pharmacy.

EFFERVESCENT PRODUCTS, INC.
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City, Des Moines, Council Bluffs, Waterloo, Dubuque and Davenport. The Committee wishes to thank Dr. Carl M. Peterson, Secretary of the A.M.A. Council on Industrial Health, for his assistance in procuring different out-of-state speakers, but it is to Dr. Walter Bierring and the personnel of the Iowa State Department of Health that most of the credit is due for the advanced ground work in attempting to educate the profession of the state of Iowa toward its responsibility in industrial health measures. We received a very favorable reaction from industrialists who attended these meetings. Quoting a statement of one, 'I assure you the privilege of being permitted to attend such a meeting has been a real stimulant toward the more favorable relationship between physician, labor and the industrialist. We appreciate most thoroughly the necessity of keeping labor's health to a maximum status as we know only by that may we hope to increase the output in industry which is so important at the present time.' There was also some criticism of the meetings. One physician remarked, 'I have been doing compensation work for the past 20 years and I do not see the necessity of trying to educate the profession along such lines.' But after attending one of the meetings he apologized for the remark and said he didn't realize what the profession as a whole might do if it would familiarize itself with some of the industrial health problems. He said, 'I have never visited any of the plants from which I have received compensation work but from now on I am going to make it a point to visit them and I might be able to suggest improvements where some of the industrial hazards might be reduced.' The Committee wishes to emphasize that it feels the immediate interest shown in the institutes in all probability was due to the publicity in advance of the program date as carried out by the State Health Department and the Speakers Bureau. The nine institutes that were held drew a total attendance of around 1200 persons.

GENERAL

AS A PART of the program of First Aid training now being carried on by plants of Carnegie-Illinois Steel Corporation, the corporation's Gary Sheet and Tin Mills have set up a round-the-clock program of first aid training which has already resulted in 692 employees completing the 20-hour Standard Red Cross course. The goal of the Sheet and Tin Mill first aid training classes is 1,500 employees completely trained in first aid practices.

AMERICAN first-aiders are committing the same blunders that the British did—they fail to examine patients carefully enough; they pay attention only to the worst injury; they use splints that are too short; they incline to be too free with the tourniquet. An editorial in a recent issue of the *British Lancet* calls for more realistic instruction of first-aiders. First-aid students should be given examples of problems they will be called upon to handle rather than long lectures on anatomy. The skill and conscience of a first-aid lecturer may mean the difference between the survival and death of somebody and, if invasion comes, the efficiency of first-aid workers may turn the scale.

—From *Modern Med.*, April, 1942.

A ROOM in the Medical Department has been equipped with a sink where goggles are sterilized with the use of the required solution. There is also an oven used for drying the goggles after they have been subjected to the sterilizing process. When dry, each pair of goggles is placed in a separate paper container, following which they are placed in stock to be issued later, or returned to the foundry to be available to the employee who turned them in to the Medical Department for sterilization.

—From "Goggle Maintenance," in Westinghouse *Safety News*, July.

IN THE last six decades (Metropolitan Life report) the life expectancy of American workers and their families, as represented by the company's millions of industrial policyholders, has increased from 34 years to the record-breaking 1941 figure of 63.42 years. In the last three decades, a gain of 16¾ years has been made in length of life, while in the last decade alone the gain amounted to 5½ years. "Today, the industrial policyholders and their families enjoy a longevity only a

THE MEDICAL RELATIONS DIVISION
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THE MOST VALUABLE
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THE COLLECTIVE EXPERIENCE
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THE PROFESSION IS
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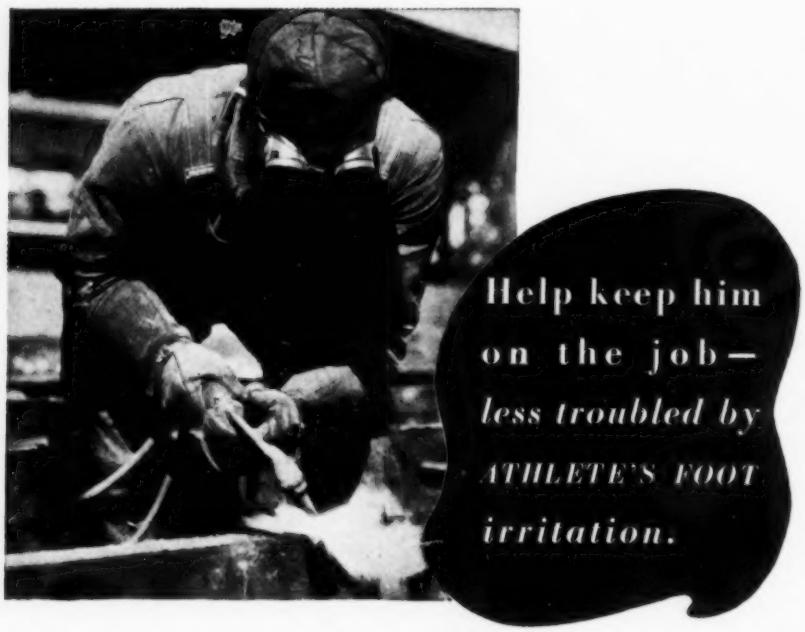

The burden of the patient with Athlete's Foot is not an easy one to bear. His mind is apt to be as much on his discomfort as on his daily work.

WHEN THIS MAN COMES TO YOU FOR TREATMENT, REMEMBER

MAZON

Perhaps you already know from clinical reports how Mazon inhibits growth of Athlete's Foot fungus—how the simple treatment with Mazon helps to clear up the affected area.

Mazon is anti-pruritic, anti-septic, anti-parasitic. It is easy to apply and requires no bandaging.

Mazon is also indicated for the relief of externally caused Eczema, Psoriasis, Alopecia, Ringworm, Dandruff and other skin disorders.

If you have never experienced Mazon's usefulness in your own practice—now is the time to test it.

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trifle below that of the general population. In 1911, however, the insured persons had a disadvantage of 6.41 years in expectation of life, as compared with the general population. In 1940 this difference had been reduced to materially less than one year. Current indications are that in 1942 the insured wage earners will be practically on a level with the general population in average length of life."

DIVISION of Industrial Hygiene, National Institute of Health, reports progress, as of June, 1942, in two current surveys: MEDICAL SERVICE FACILITIES.—Eighty plants, employing 225,000 workers, in Pennsylvania, Delaware, and New Jersey have submitted data on their medical service facilities for compilation and analysis. DUTIES OF NURSES IN INDUSTRY. — Revised forms have been completed and submitted for analysis by 161 establishments, employing 448 nurses and 300,000 workers, in connection with the nationwide survey now in progress.

THE Industrial Nurses of Texas are cooperating with the U. S. Public Health Service and the State Department of Health in conducting a survey of industrial nursing throughout the state.

THE industrial hygienist should have fundamental training in the sciences and the humanities. The industrial physician should have a preliminary training similar to that of the health officer, and after his graduation in medicine should have supplemental training and field experience not unlike that of the health officer, with, however, major emphasis in the field of industrial hygiene and environmental health. Likewise the industrial public health nurse and the public health engineer who specialize in the industrial field should possess the basic training and experience common to other public health nurses and public health engineers, to which should be added specialized emphasis in the field of industrial service.

—From *New York Sun*, June 17, 1942. of Industrial Hygienists." *Am. J. P. H.*, July, 1941.

AMONG industrial policyholders of an insurance company, tuberculosis accounted for 19.1% of all deaths among single males between the ages of 20 and 44, but only for 11.4% of the deaths among the married. The proportion of deaths from tuberculosis is even higher among the widowed, namely, 23.1%. The rates for alcoholism, accidents and syphilis are also higher among the single and widowed than among the married.

—From *Med. Rec.*, March, 1942.

A PROPERLY administered health program should: "(1) Prevent disease or injury in industry by the establishment of proper control over industrial environment; (2) Promote restoration to health and earning capacity as promptly as possible after industrial injury or disease; (3) Conserve the health of workmen through physical supervision and education. These are expressions concerning scopes and not of specific functions."

—A. M. A. Council on Industrial Health.

THE vital vitamin has added its services to summer war production. It's vitamin C, which du Pont physicians have found will prevent heat prostration, even in a temperature above 100° F. and high humidity. Successful tests of feeding workers daily two pills containing a total of 100 milligrams of vitamin C suggest that these would prove valuable in steel mills, foundries and shipyards, as well as in engine rooms of naval and transport ships and among troops in the tropics, according to Dr. John H. Foulger, director of du Pont's Haskell Laboratory of Industrial Toxicology at Wilmington, Delaware. This vitamin is apparently needed to maintain tone in the muscles of the blood vessel walls. In heat prostration there is a loss of the tone necessary to help move the blood back to the heart, with a consequent collapse of the circulation, besides the dilation of the skin vessels in an effort to pipe more heat-laden blood to the surface to be cooled. Studies have shown that both vitamin C and vitamin B_1 are drained from the body in the sweat, just as salt is. Salt pills have been installed near many factory drinking fountains so workers may replace the sweated out salt, the loss of which is a cause of heat cramps and prostration. A proper combination of vitamins, along with the salt, is effective in staving off these attacks. In the tests of giving workers vitamin C pills during several weeks

WOUND INFECTION

its prevention and control

. . . in Lacerations

Treatment of lacerated wounds is assuming an increasingly important role in both military and civilian practice. It should be assumed that such wounds, since they are produced other than with surgical intent, are infected and must be treated accordingly. Generally recognized as the most important factor in delaying wound healing, infection must be controlled to reduce the period of partial or total disability.

Many clinical reports in the literature attest to the unusual effectiveness of Azochloramid in the early control of infection. In their paper entitled "Treatment of Infected Wounds" (N.Y.S. Jour. Med., Vol. 36, No. 22) the authors conclude that . . . "Azachloramid, particularly Azochloramid in Triacetin, because of its efficacy, simplicity of application and low toxicity, deserves a prominent place in the treatment of infected wounds."

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Azochloramid is in extensive use by the U. S. Army and Navy

Trial quantities and comprehensive literature sent to physicians on request

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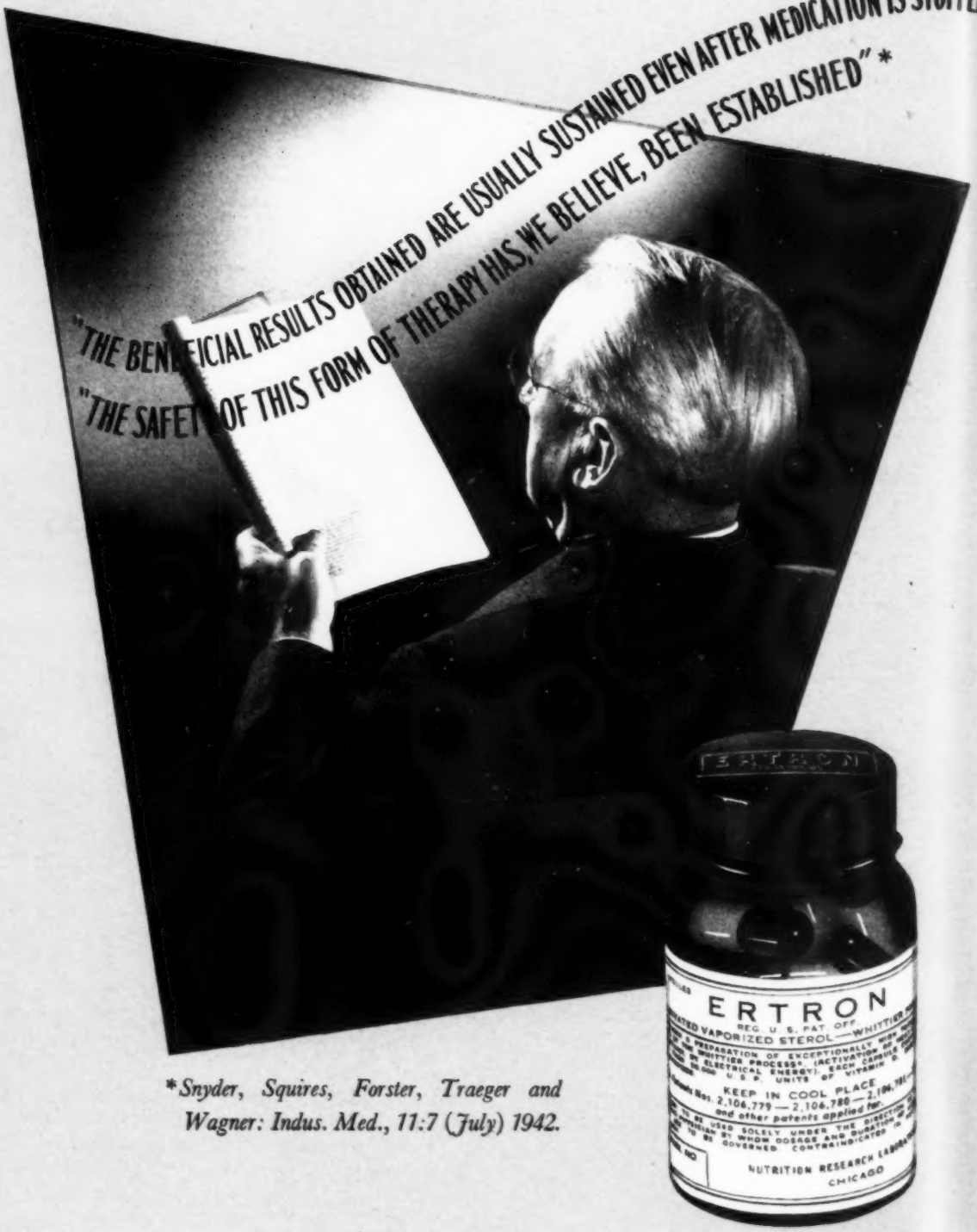
"THE BENEFICIAL RESULTS OBTAINED ARE USUALLY SUSTAINED EVEN AFTER MEDICATION IS STOPPED
"THE SAFETY OF THIS FORM OF THERAPY HAS, WE BELIEVE, BEEN ESTABLISHED" *
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VAPORIZED STEROL
KEEP IN COOL PLACE
NUTRITION RESEARCH
CHICAGO

*Snyder, Squires, Forster, Traeger and Wagner: Indus. Med., 11:7 (July) 1942.

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. . . confidence of safety, because ERTRON is prepared by the special Whittier process of activation.

. . . confidence of results, because ERTRON may be administered in sufficient dosage to be effective in arthritis.

Safety and Effectiveness Stressed in the Literature

Many articles have appeared in the current literature on ERTRON therapy. These clinical studies on hundreds of cases have demonstrated both safety and effectiveness with ERTRON.

Every published report on a large series of ERTRON-treated cases has confirmed the observation that adequate treatment with ERTRON is without serious toxicity and is effective in the large majority of cases.

ERTRON* for ARTHRITIS

The best clinical response is noted when ERTRON is administered in adequate dosage over a long period. A suggested outline of Ertronization is available on request. Likewise, a bibliography of the literature to date will be sent to interested physicians.

ERTRON is high potency, activated, vaporized ergosterol (Whittier Process), 50,000 U.S.P. Units per capsule. Now available on your prescription at new low prices:

BOTTLES OF 100 $8.00 BOTTLES OF 50 $4.50

ERTRON is made only in the distinctive two-color gelatin capsule.

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Chicago, Illinois

This Army has been "mechanized" for years!

To millions of Americans, this familiar insignia symbolizes an unfailing response in time of need—a faithful guardian of public health. Now, with our country steeled to defend the fruits of democracy against aggression, the task of maintaining a physically-fit America takes on even greater significance.

In this emergency, a genuine but perhaps unconscious tribute is being paid the medical profession. America has taken for granted your ability to maintain the Public Health during the trying days that lie ahead. Keeping that trust requires not only your professional skill but an adequate supply of the materials you use.

If Intensifying or Fluoroscopic Screens play an essential part in your work, Patterson has an important message for you. Our manufacturing facilities are being devoted entirely to the demands of the military and civilian health services. Exhaustive testing and research programs are being maintained. Vigilance over raw materials has been increased. As a result, you can be certain of obtaining the same degree of performance from Patterson Screens—today, tomorrow and "for the duration".

PATTERSON'S facilities devoted 100% to Public Health and Defense of the United Nations

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Patterson X-Ray Screens

at jobs in a temperature usually far above 100° there was only one who showed signs of incipient heat attack. That was on a Monday, after the worker had attended a week-end party. The alcohol he had consumed had lowered his resistance to the heat.

—From *New York Sun*, June 17, 1942.

THE Bureau of Industrial Hygiene of the Michigan Department of Health recently completed a study of industrial plants in Hillsdale County to determine industrial growth. In Hillsdale County, which is typical of the state counties which are not predominantly industrial but which are experiencing an increase of industry devoted to war needs, the study showed that plant employment had increased over 60% during the last year at an estimated 2,300 plus. A 25% gain in the number of industries has been recorded during the last three years. Activities of the bureau of industrial hygiene are directed at controlling the environmental influences which affect the physical and mental health of the worker, the placing of workers at tasks for which they are physically equipped, the maintaining of physical and mental fitness of workers after they are placed in jobs and the reducing of the amount of productive time and wages lost because of sickness or accident, whether due to occupational or to non-occupational causes. A release from the state department of health stated that 65% of Michigan's industrial workers and 63% of the state's industrial plants are located outside Detroit.

—From *J.A.M.A.*, July 11, 1942.

ECONOMIC security and an opportunity for creative self-expression are necessary for the development of a normal mind, in the opinion of Dr. Nathaniel Cantor, University of Buffalo, N. Y. Neurotic modern civilization makes it impossible to attain the essential attitudes necessary for an ideally rounded, nicely balanced personality. The average individual lives in a constant fear: fear of not obtaining work or losing his job, fear of sickness, dependency, of bills and landlords, and fear even of being himself. Desires are set up, but the means of satisfying them are not at hand. Normality of mind is characterized by a friendly relation to others, by a tolerance toward those who differ. "To live and let live" best characterizes a normal mind. To be one's self, to accept one's own limitations, to recognize the inconsistencies in one's own behavior without feeling too guilty, and to recognize the inconsistencies in the actions of others without feeling too hostile, is to approach normality of mind.

—From *Modern Med.*, April, 1942.

A SOCIAL order does not fall off its bicycle going too fast; it falls off going too slowly. That is what the Weimar Republic did. It moved in the right direction so slowly that it could not stay on its bicycle. That is what we are doing today, moving in the right direction so slowly that we cannot stay on the democratic bicycle. We need bold strokes in the field of equality of opportunity, in the field of racial equality, in the field of providing equal access to all the basic facilities of life in the midst of peace or in the midst of war. If it is more difficult to do those things in the midst of war, then we face that difficulty only because we did not do them in the midst of peace. We do not thereby escape the obligation to do them even under the more difficult circumstances.

—From "Wartime Social and Economic Adjustments," by MAYNARD C. KRUEGER in *Pub. Health Nursing*, July, 1942.

THE Legislature of the State of Rhode Island passed the Rhode Island Cash Sickness Compensation Act on April 29, 1942. In brief, this Act provides for the payment of cash benefits to workers as compensation for wage losses due to unemployment caused by sickness. Effective June 1, 1942, employee contributions of 1% are to be deducted from total wages (on the first $3000 paid to each employee) and paid into the Rhode Island Cash Sickness Compensation Fund. Another 0.5% deducted from total wages (on the first $3000 paid to each employee for the remainder of the calendar year of 1942) will be

The Seven Requirements of an Ideal Dressing for Superficial Injuries and Burns

CHECK YOUR present first aid dressing against the criteria set forth by the makers of Unguentine:

1. The ideal surgical dressing should be an effective antiseptic and germicide.
2. The ideal surgical dressing should be analgesic, soothing and healing to injured tissue.
3. The antiseptic must be present in sufficient concentration to be effective.
4. The vehicle carrying the antiseptic must be such as readily to release the antiseptic properties to surrounding tissues in the human body.
5. The nature of the dressing should assure prolonged and continuous antiseptic contact so as to destroy the bacteria present and prevent reinfection.
6. The character of the dressing should be such as to make dressing easy and constant renewal unnecessary.
7. The antiseptic must be non-toxic, non-irritating to the patient and non-deteriorating with age.

Many physicians have adopted Unguentine for first aid dressings, because it is obvious that the above qualifications describe the properties of this famous antiseptic ointment.

Physicians may order Unguentine in one pound and five-pound tins or in handy tubes and jars from their usual source of medical supplies.

*UNGUENTINE
—A USEFUL SURGICAL DRESSING

1. UNGUENTINE conforms to the modern concept of a useful antiseptic surgical dressing—neither dry nor wet—adaptable to sustained contact with the injured area.

2. UNGUENTINE is antiseptic and germicidal even in the presence of serum and other organic matter, yet is non-toxic and non-irritating.

3. UNGUENTINE exhibits a soothing local anesthetic effect that quickly helps relieve the pain of denuded areas of the skin, as well as burns.

Sample free to physicians on request

THE NORWICH PHARMACAL COMPANY
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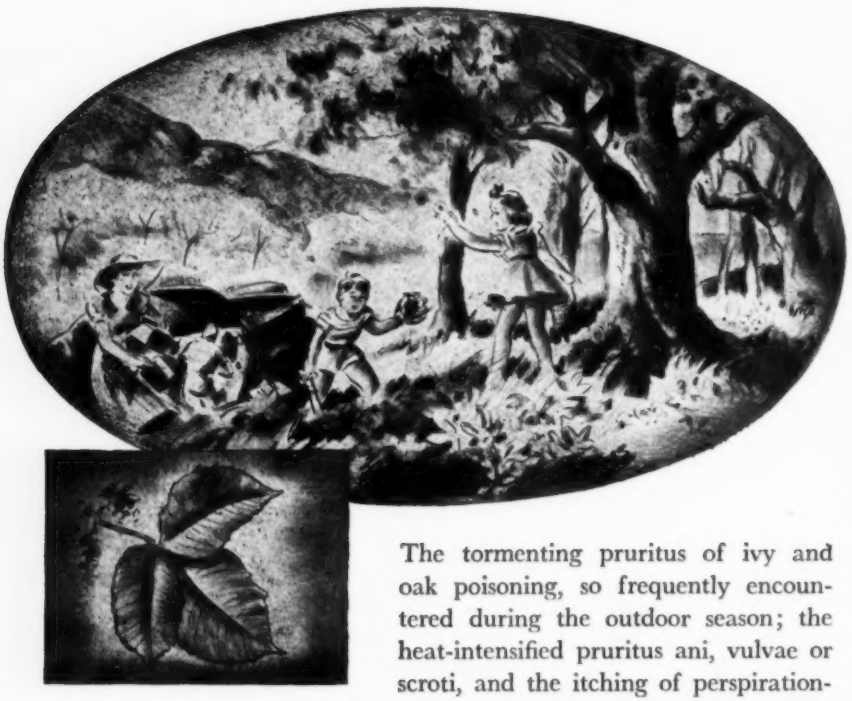
IN THE CUTANEOUS DISORDERS
OF THE SUMMER SEASON



The tormenting pruritus of ivy and oak poisoning, so frequently encountered during the outdoor season; the heat-intensified pruritus ani, vulvae or scroti, and the itching of perspiration-aggravated eczema, ringworm, intertrigo, multiple insect bites and urticaria quickly yield to Calmitol. Not only is relief obtained with dramatic promptness, but a single application usually suffices to hold pruritus in abeyance for several hours.

Because of its contained ingredients (chlor-iodo-camphoric aldehyde, levo-hyoscine oleinate, and menthol in an alcohol-chloroform-ether vehicle), Calmitol Ointment blocks the further transmission of offending impulses, exerts a mild antiseptic action, contributes to resolution by local hyperemia. In obstinately severe pruritus, Calmitol Liquid is recommended, except on sensitive areas or denuded surfaces.

Thos. Leeming & Co. Inc.
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CALMITOL
THE DEPENDABLE ANTI-PRURITIC

paid into the Rhode Island Unemployment Compensation Fund. Employees who have already contributed the maximum to the Unemployment Compensation Fund, namely $45.00, shall not be required to make any further contribution to such fund, but shall be required to pay 1% on the first $3000 paid to them, by their employer or employers, to the Sickness Compensation Fund for the period beginning June 1 and up to and including December 31, 1942, and each calendar year thereafter. Effective June 1, 1942, any employing unit which is an employer under the Rhode Island Unemployment Compensation Act, as amended, is subject to the provisions of the Rhode Island Cash Sickness Compensation Fund. Copies of the Sickness Compensation Act and amendments to the Unemployment Compensation Act, together with regulations, are being printed and mailed to all employers.

COLUMBIA University announces that beginning September, 1942, a program of professional studies for the training of Physical Therapy technicians will be offered. This training and instruction will extend over a two-year period and has been organized in compliance with the requirements set down for such programs by the Council on Medical Education and Hospitals of the American Medical Association. The course is being set up in University Extension in close relationship with the College of Physicians and Surgeons of Columbia University, the Nursing Education and Health and Physical Education Departments of Teachers College. The clinical and laboratory instruction will be given at the Vanderbilt Clinic, Neurological Institute, Presbyterian Hospital and New York Orthopedic Dispensary and Hospital. Two years or 60 semester hours of college, including courses in Physics and Biology, shall be required, or graduation from an accredited School of Nursing or an accredited School of Physical Education. A Certificate of Proficiency in Physical Therapy will be granted by Columbia University to those completing the course. Further information may be obtained by writing the Office of the Committee on Physical Therapy, Room 303B, School of Business, Columbia University, New York City.

TO MAKE the most of his responsibility toward industrial workers, the doctor should:

1. Inform himself concerning occupational diseases so that he may recognize such disease more readily in the course of his practice.
2. Be prepared to diagnose and treat such ailments in the course of his everyday practice.
3. Obtain an accurate and detailed occupational history including information concerning the patient's exposure to toxic materials.
4. Adopt the same attitude toward reporting an occupational disease as now exists in reporting a communicable disease.
5. Be prepared to advise the individual patient not only in the prevention and control of disease arising out of occupation, but also in the promotion of general health and mental well being.
6. Utilize to the fullest extent the services offered by the official hygiene unit and, through it, the facilities available to the entire health department.
7. Stimulate pre-employment and periodic physical examination of workers in industry, and call attention to the necessity for correcting the physical defects revealed by health examinations.

—From "The Private Physician's Opportunity in Industrial Medicine," by J. J. BLOOMFIELD, *New England Med. J.*; abstr. in *Modern Med.*, April, 1942.

OFTEN the divisions are not equipped to render direct medical services because of prevailing policies or lack of personnel. In such instances they establish cooperative working relationships with the local health agencies. For example, cooperative programs with local medical societies and other health agencies are being developed in one state for the promotion of medical examinations in small plants. Two areas were selected to try out the program. A similar program has also been planned which provides for full-time health services in seven counties of the state. It will include a survey of all industrial plants in cooperation with private physicians located throughout these areas. The same state reported a joint inves-

NOTABLY IN DEEPER BURNS

FOILLE

Affords Marked Clinical Advantages

OF VITAL INTEREST TO THE INDUSTRIAL SURGEON IS REDUCTION OF COMPENSATION COSTS

The following evidence may be of value to the Industrial Surgeon: Four years ago, FOILLE was introduced to the medical profession and particularly the industrial surgeon, since he sees more burns than any other medical group. Proceeding on the basis that a burn was a wound, it was found that FOILLE offered an improved local treatment for burns, that FOILLE immediately alleviated pain to a marked degree; that it progressively but definitely coagulated serous exudate; that it well controlled sepsis; that it stimulated granulation and afforded earlier skin-grafting in third degree burns; that because of rapid epithelization, it lessened areas requiring grafts, and that in burns involving faces, hands, feet and joints it largely eliminated scarring contractures and loss of manual functioning.

These claims have been so clearly substantiated in wide adoption by the "400" of national industry, in hospital, first-aid dressing rooms and emergency first-aid kits, in a majority of aircraft plants, steel, petroleum, chemical, and defense institutions, by controlled, comparative, medical studies and other clinical evidence, as to indicate a definite contribution to local burn therapy.

Ample clinical material will be furnished any surgeon to provide him opportunity to make his own critical, comparative evaluation.

Write for literature and clinical sample of Foille.

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CUPREX
REG. U. S. PAT. OFF.
has definite advantages for the relief of PEDICULOSIS

★ **Destroys the nits** as well as the lice

★ **Quick Action**—Entire treatment may be completed within 15 minutes

★ **No embarrassment** for the patient

★ **No messy** or repeated applications

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LITERATURE ON REQUEST

tigation by the local tuberculosis society in a garment plant employing approximately 400 women. The results disclosed that 11 active cases had been removed from the plant during the past four years. A total of 290 employees was x-rayed and of this number 3.8% were found positive. Follow-up on contacts of these cases will be made and cases will be placed under treatment if indicated. The company further agreed to conduct pre-employment medical examinations on all new employees.

—From "An Analysis of Industrial Hygiene Activities in State and Local Health Departments, 1940-41," *Public Health Reports*, 57:23, June 5, 1942.

ACCORDING to Gerson, special problems in nutrition arose in Germany when the army began to increase. Physicians were put to work. Vitamin C deficiency was found to be prevalent. There were many cases of pyorrhea and other dental diseases as well as scurvy and stomatitis. Constipation and the nervous soldier-heart were also predominant. As a result the following foods were emphasized in the diet of the army: potatoes prepared in various fashions, cheese, milk, sour milk, legumes, rice, oat and barley products, flour and pastries, vegetables and fruits. Meat became secondary, the heart, liver, kidneys and lungs being more widely used. The aromatic vegetables such as tomato pulp, fresh onions, and others, as well as dried vegetables and fruits, were used. Fresh salads either raw or mixed with cooked vegetables were also added. Spices and salt and pepper were cut to a minimum. Dried vegetables and vegetable powders were highly recommended since they are ready to be cooked without cleaning and waste, are condensed and thus easy to transport, cook in a comparatively short time, there is no possible bacterial contamination, and they are tasty. At first it was difficult to make the soldiers like an almost strictly vegetarian diet but they have become accustomed to it and their efficiency has greatly increased as a result.

—Abs., *Med. Times*, May, from *New York State J. Med.*, 41:1471 (1941).

THE Illinois Nutrition Committee, under the leadership of DR. LYDIA J. ROBERTS, Department of Home Economics, University of Chicago, has authorized the formation of a Sub-Committee on Nutrition in Industry. While this committee is not fully staffed, its present membership consists of DR. MILTON H. KRONENBERG, Chairman; DR. C. O. SAPPINGTON; MRS. CHRISTIAN SEABROOKE, R.N.; MISS LEONE PAZOUREK; DR. RUTH BLAIR; MISS EDNA ZIMMERMAN; and MISS GERTRUDE SMITH. It is expected that this committee will give attention particularly to the problems of nutrition in industry in Illinois.

THE treatment of asthma with helium-oxygen mixtures is an important field of use for this gas and it is being investigated further by the medical profession. More helium is required for this purpose than for any of the other "breathing" uses. Experiments are now being conducted by the Bureau of Mines and medical authorities with regard to helium as a diluting agent in anesthetics to prevent fires and explosions in operating rooms. Medical research is also being directed toward the use of helium-oxygen to alleviate tubal and sinus blocks in compressed-air workers. The same helium-oxygen mixtures employed to give relief to deep-sea divers has been applied to workers in caissons and tunnels where the pressure is considerably above that of the atmosphere.

—Bureau of Mines Information Service.

Occupational Dermatitis

IN DISCUSSING this subject, I am aware of the obstacles that present themselves: the language difficulties, the intelligence and cooperation of the patient affected, or, rather, the absence of them, the lack of accurate knowledge of the average employee of processes and materials, the long duration of disease before a competent opinion is obtained, the previous and often excessive treatment, the fact that other

EFFECTIVE AIDS *to Maximum Working Efficiency*

Mineral Salts Replacement in Heat Fatigue

Industrial physicians are finding that workers subjected to excessive heat do not tend to suffer from disabling heat "cramps", heat prostration, or even heat fatigue, if undue sweat loss is compensated by the use of

TABLETS PERSALS

Persals replace not only Sodium Chloride but the other important salts that research has shown to be lost during perspiration. Sugar-coating eliminates the tendency to the nausea frequently associated with ordinary salt tablets.

Formula	GRAINS	GRAMS
Sodium Chloride	7.00	0.454
Calcium Gluconate	0.25	0.016
Potassium Sulfate	0.15	0.010
Magnesium Phosphate	0.10	0.006

together with Sucrose. Sugar coated white.

Supplied in bottles of 100, 500, 1,000, 5,000; and in bulk.

Reducing Lost Man-Hours in Burns

By quickly and effectively combating infection, reducing toxemia, stimulating healthy granulation and lessening tendency to crippling contracture, Dymixal is helping to save valuable "man-hours".

DYMIXAL

(U. S. Pat. 2103309)

The "Triple Dye" Treatment

has a high specificity against Gram-positive and Gram-negative organisms (1)— "...the dyes are specific for the bacteria found in burns . . . " (2).

Two Convenient Forms

Jelly Dymixal—2-oz. tubes.
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1. Aldrich, R. H.: "The Story of Burns"—1941, Page 21.
2. McGandy: Minn. Med. January, 1938.

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HERE is a light especially designed to help you in all surgical attention to the eye, ear, nose and throat.
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agents may cause similar manifestations, and the apathy or possibly the dislike of some manufacturers to disclose trade formulas and other secret information. I am also cognizant of the obstacles in diagnosis for the industrial physician or general practitioner who has had dermatologic training only in his regular medical-school course. There is enough difficulty for the trained dermatologist in many cases. General practitioners see a relatively small number of cases of the same disease, whether it is scabies, lichen planus or lupus erythematosus. It is natural, therefore, that they will not have a familiarity with the atypical and borderline manifestations, and especially the overtreated cases. Moreover, many physicians lack the knowledge of the actual ingredients that the worker is using and of the processes employed. Furthermore, I am aware of the difficulty encountered in rendering a clear-cut opinion of occupational or non-occupational liability in every case, for many cases must be classified as "probably" or even "possibly" industrial. In addition, in some states, only certain diseases are listed in a category legally acceptable for compensation. In other states, compensation is granted for complications of occupational dermatoses or for exaggeration by occupation of existing skin disease. There is thus a definite need for the adoption of more uniform legislation covering this field, for a more systematic review of suspected cases, for the establishment of acceptable standards of definition, criteria, etc., and for the development of well-standardized preventive measures that can be universally adopted. Wide publicity must be given to the fact that occupational diseases in general are preventable and that the fullest use of accepted medical procedures will definitely aid in the recognition of this group and thus prevent not only disability of the patient but also possible serious disturbance to industrial production.

—From "The Recognition of Occupational Dermatoses," by C. GUY LANE, M.D., in *New England J. Med.*, July 9, 1942.

Executive Health

DR. THEODORE L. STORY, Medical Director, American Optical Company, in an inter-office comment on the Health of the Executive: "Of course, the first important step in trying to conserve the health of executives, is to ascertain what their physical condition is. This can only be obtained through history taking and physical examination. Naturally, physical defects found, appearing in their incipiency, can be often times eliminated or greatly helped. However, the temperament of the individual and his psychological reaction to increased work make the problem not the same for any two people. It resolves itself, therefore, more or less into an individual study of the executive. My personal feeling is that, of course, rest is one of the best body repairers, and a busy executive should arrange his schedule so as to make it possible to get in certainly a definite number of hours sleep and also try to weave into his program one or two short rest-hour periods during the day. The carrying of work home, both materially and mentally, of course is bad. The question of vacations has been discussed previously. Whether a longer vacation is preferable to more frequent ones is debatable. Personally, I feel that more frequent time off, such as long week-ends, and holidays, supplemented by the regular vacation, is the answer. The trouble with most of us is that under the increased strain of our total war efforts, we fail to take notice of the cardinal rules for maintaining health under normal conditions, i.e., watching the waist-line through the amount of food we take in, avoiding the excesses such as drinking, smoking, etc., and, above all, seeing to it that we have a definite number of sleeping hours every day. Strain due to overwork or not, we have to face the definite fact that, as years progress, material changes in the body are bound to occur. Our problem, therefore, is to conserve our effort as much as possible, and not add to it

IMPORTANT ANNOUNCEMENT

A New Industrial Skin Cleanser Which Does Not Tend to Defat the Skin

WEST'S SULPHO HAND CLEANER

Harsh skin cleansers frequently have been found to be the actual cause of Occupational Dermatitis. This fact is not unknown to safety engineers or to industrial doctors and such cleansers in industrial plants have been replaced with non-irritating soaps. It has been found, however, that a great deal of damage to the skin has been caused by kerosene and solvents in which certain plant employees must work. These types of irritants tend to dry the skin and make it more susceptible to dermatitis.

For those employees who work in kerosene, solvents and other skin drying chemicals, West has developed a new specialized type of hand skin cleanser. West Sulpho Hand Cleanser is made of sulphonated castor oil combined with a wetting agent plus a small amount of a chemical cleaner. Due to the nature of the product, it has a very low pH. It is specially designed not to defat the skin. Special dispensers have been developed for the economical use of West Sulpho Hand Cleaner.

Although most plants already have installed a general industrial hand soap for use by their employees, we would suggest the use of this new product in those departments where the danger of dermatitis is especially great and where employees are using kerosene and solvents.

The West Company will be glad to furnish you with samples for a practical demonstration in your plant.

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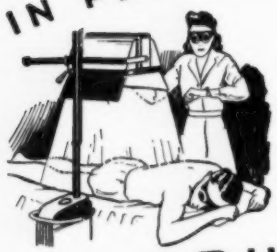

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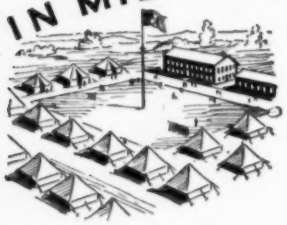

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or increase its rapidity through injudicious methods of eating, working, etc. Each individual has to analyze his own responsibilities and, after having a complete physical check-up and knowing his limitations, has to adjust himself according to that set-up. Whether he needs added assistance or the need of delegating more work to subordinates, is a problem which the good executive can easily determine for himself. I am just trying to point out that I think there is no fixed and standard rule for this problem. I believe it is entirely individualistic, except as supplemented in general by physical examinations for all."

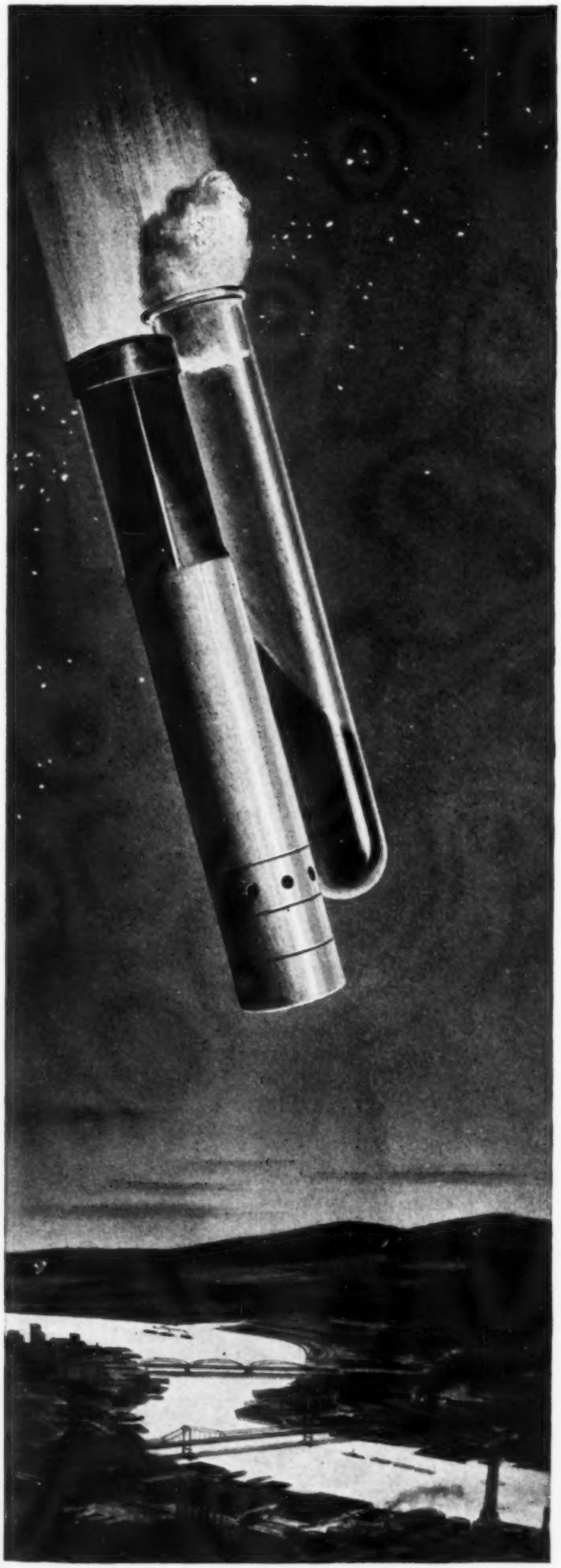
California Institutes

CALIFORNIA physicians are planning a series of institutes on the health protection of war workers. These will be one-day sessions, August 18-28, in seven centers in the state. The programs are being planned to interest not only physicians but also industrial nurses, safety engineers, and industrial management. The sponsoring groups are: California Medical Association Committees on Postgraduate Activities and on Industrial Practice; the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS; and the California State Department of Public Health. Only two other states, Iowa and Connecticut, have held similar meetings for physicians who have been called upon by industry to supervise the health and give medical care to men and women in the war industries. For many medical men, the role of industrial physician is new. The institutes will assist all physicians whose services are in any way being rendered to industrial workers. Problems and the most modern approaches to their solutions which will be discussed include: medical relationships in industry; the importance of industrial hygiene in war production; pulmonary diseases in industry; medical and engineering control of occupational diseases; the physician's legal responsibilities and the surgical management of industrial injuries. Among the leading specialists in the fields of industrial medicine and hygiene who will head the institutes will be CAREY P. MCCORD, M.D., Medical Adviser, Chrysler Corporation, Detroit; J. J. BLOOMFIELD, Chief, States' Relations Section, Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Maryland; DONALD E. CUMMINGS, Director, Division of Industrial Hygiene, University of Colorado School of Medicine and Hospitals, Denver; HAROLD T. CASTBERG, M.D., Acting Chief, Industrial Hygiene Service, California State Department of Public Health; and CARL H. FRY, Chief, Industrial Accident Prevention Bureau, California Industrial Accident Commission.

Eye Hazards

IN THE past year or so there has been a vast increase of industrial activity in West Virginia. To see former residential and farm areas now taken over by various kinds of manufacturing brings a vivid realization of what "all out for production" means to a community and of what must be the many problems involved in such change. "More planes, more tanks, more guns . . . more ships to carry them" is the slogan of the National Safety Council in its campaign just started to prevent accidents and conserve manpower; unless the Council is successful in its drive and in the objective of securing help from every volunteer and public agency concerned, a slogan equally appropriate through the days to come will be: "More hazards, more accidents, more ill health, more blindness." That seems a strong statement, but already the accident rate has risen sharply since 1940; the Bureau of Labor Statistics (U. S. Department of Labor) has stated that with an 11% increase in employment an increase of 29% in accidents has been noted. A logical supposition is that a steadily growing frequency of eye accidents will follow unless a very aggressive counteractive program is instituted. Recently, the National Society for the Prevention of Blind-

—*Continued on page 398*



BACTERIOLOGIC WARFARE?

• Bacteriologic warfare appears unprofitable because it is questionable whether it would add to existing problems of defense against pathogenic organisms. In the United States, for example, war production is considerably hampered by the common cold, that familiar phenomenon which deprives the nation of at least 45 million man-days of work each year—the equivalent of the full-time annual labor of 150,000 persons.[1] Colds are responsible for an estimated half of all work losses due to illness.

Fortunately, the incidence and severity of the common cold may now be reduced by means of 'Vacagen' Oral Cold Vaccine Tablets.

Since colds may be caused by viruses, bacteria, or a combination of both agents,[2] and immunologic response to the so-called cold virus is relatively transient, protective measures are directed towards active immunization against specific bacteria associated with severe types of coryza. Oral administration of the water-soluble antigenic factors of these bacteria has proved to be an effective means of establishing immunity from them.

• • •

Each 'Vacagen' Tablet contains carefully proportioned quantities of the water-soluble antigenic derivatives of approximately 60,000 million organisms commonly associated with infections of the upper respiratory tract. The fresh antigens are rapidly frozen, dehydrated under high vacuum, and made into enteric-coated tablets for oral administration.

'Vacagen' Oral Cold Vaccine Tablets are supplied in bottles of 20, 100, 500 and 1,000.

1. Lanza, A. J.: J. A. M. A., 116:1342, March 29, 1941.
2. Zinsser, H., & Bayne-Jones, S.: A Textbook of Bacteriology, D. Appleton-Century Co., 1934.

'VACAGEN' ORAL COLD VACCINE TABLETS

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"Today the outstanding drug for the treatment of gonorrhea is *Sulfathiazole*"[1]

THE EXECUTIVE COMMITTEE of the American Neisserian Medical Society states that in the treatment of gonorrhea there is ample evidence that the highest percentage of cures is to be found among ambulant patients who receive 20 grams of sulfathiazole during the first week of medication.[1]

This five-day treatment for gonorrhea which was developed in the Venereal Disease Research Laboratory of the U. S. Public Health Service has been found effective in females as well as in males. Their recommended dosage is one gram orally after each meal and at bedtime for five days. Rigid clinical criteria have shown that with such treatment about 80 per cent of cases can be cured.

Thus Sulfathiazole offers the advantage of being effective in small dosage . . . in both sexes. Treatment is short . . . highly successful . . . and comparatively free from severe toxic effects.

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Caution: All sulfonamide compounds should be administered with due recognition of their side effects and contraindications. Information concerning their proper uses will be sent to physicians on request. Address the Professional Service Department, 745 Fifth Avenue, New York.

E·R·SQUIBB & SONS

[1] *Venereal Dis. Inform.* 23:88.

MANUFACTURING CHEMISTS TO THE MEDICAL PROFESSION SINCE 1858

This magazine is published to promote sound thought upon and concerning industrial medicine and traumatic surgery. To that end it will contain articles, news items, reports, digests, and other presentations, together with editors' comments. The editorial policy is to encourage frank discussion. On this basis contributions are invited.

Industrial Medicine

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The editors will exercise care in checking on the accuracy of data printed, but in all other respects articles and opinions of which expression is allowed are the opinions of their authors—the editors reserving in all cases the right to comment on the same, in the current or any subsequent issues, as they may be inclined.

The Journal of Industrial Health, Occupational Diseases and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 11 August, 1942 Number 8

Periodic Health Examinations

—Important Findings among Garment Workers—

LEO PRICE, M.D.,
Assistant Director, Union Health Center,
New York City

EFFICIENT production has become the universal concern in this world-wide crisis. It is in great part dependent upon the health of the army of workers who must lose no time because of disability from illness. These factors shut off the earning power essential to existence and bring with them expenses for doctors, hospitals and medicine which the resources of the worker cannot afford.

The public approach to the health problem of the low-income earner has been to offer charitable medical care in the hospitals and clinics. However, neither the paternal interest of government nor the practical interest of management can replace the worker's natural interest in his health and ability to earn a livelihood for himself and family.

Industry, desirous of lowering rates for accidents, has attempted in part to control disability and occupational diseases by physical examinations of its employees. Labor, however, has been slow to take advantage of health control measures which obviously concern them so much. This delay is explained by an all-absorbing interest in the important problems of organization and the contest for better wages and working hours. It is, therefore, interesting to examine an experiment in medical service that has been fostered and developed by a labor union.

This experiment was begun 28 years ago by Dr. George M. Price when the International Ladies Garment Workers union did not then have its present strength, nor did it have the better working conditions that exist today. This union is now made up of 267 locals throughout the United States; it has 298,756 members. Thirty of these local unions are situated in greater New York with an aggregate membership of 140,748. Sixteen of these have health programs and three have special tuberculosis aid programs.

The Union Health Center and Its Services

THE establishment of the Union Health Center in 1913 was an outgrowth of the general strike of the cloak and suitmakers in New York City during 1910, in which the unsanitary conditions and the consequent poor health of the workers prevailing in the garment trades at that time was a major issue.

The primary objective in founding this Center was to offer the poorly paid garment worker and his family an opportunity of receiving medical care of a higher quality than was otherwise available to persons with low incomes. It was also intended to demonstrate that such care could be provided at a nominal cost to the individual through the combined efforts of large groups of workers, with the balance—an actually greater cost—being borne by the parent union.

While the Center does not attempt to provide complete medical care for its members, it aims: (1) to provide medical care for the immediate benefit of ambulatory patients, (2) to examine prospective members seeking admission to the union, and (3) to administer and supervise the medical aspects of the many sick benefit systems. The worker is given the opportunity of consulting with general practitioners and specialists at a time and place most convenient for him; and every modern diagnostic means has been made available at a nominal cost.

From a very modest beginning, the Union Health Center has grown to an institution which now occupies 20,000 square feet, being part of the twenty-fourth and the whole of the twenty-fifth floor of a 27-story loft building. This ambulatory clinic is under the supervision of a medical director assisted by a staff of about 70 physicians, the number varying according to seasonal requirements. In addition there are 10 nurses, five technicians in the diagnostic departments, two druggists and a large force of clerical assistants.

TABLE I.
ATTENDANCE, 1913-1941

Year	Examinations	Average
1913	1,234	
1914-1920	46,491	6,642
1921-1926	124,670	20,778
1927-1933	110,918	15,845
1934-1940	510,217	72,888
1941	115,335	

An increasing rate (exclusive of the 1927-1933 period) in the number of annual attendances made at the Union Health Center during its existence is shown in Table I.

Presented at the Twenty-seventh Annual Meeting of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, Cincinnati, April 14, 1942.

An average rise is seen from 1,234 examinations during its first year (1913) as compared with an annual average of 6,642 for the years 1914-1920—a period of struggle and effort in the organization, affecting the health of its members.

The span from 1921 to 1926 was a period of development in the garment industry, showing a rapid advance to 20,778 examinations for each of the six years.

The lower average attendance at the clinic during the years 1927-1933 (of approximately 15,845 for each year) was due to disruption in the union caused by communistic influences, and hence lack of concern in the maintenance of health programs.

Following the re-organization of the industry through the National Recovery Act there was an increase in the membership and many local unions established health programs during the 1934-1940 period. This was reflected in the tremendous rise to an approximate yearly average of 72,888 medical examinations at the Center. The number has steadily increased, reaching 115,335 examinations for the year 1941.

Economic Status of Garment Workers

IN SPITE of improved working conditions today, the average yearly income of garment workers in New York City is only $1,034.46. The average income of cloakmakers is $960.00, and of dressmakers $880.00. An annual income of $1,500.00 is considered unusually high in this trade, while many have only an earning capacity of $500.00.

Among the dressmakers, 18% were found to have one dependent, 51% to have two or three dependents, 24% four or five dependents, and approximately 4%, more than five dependents. Seventy-two per cent of them are the sole wage earners in the family, and 90% claim to be in debt during the slow season. Only 14% have savings accounts, 56% of which are below $100.00; 11% have accounts $200.00-$300.00, and 14% over $300.00.

Only 54% of the dressmakers have life insurance. Half of these policies range from $1,000.00 down to $100.00, the balance are for more than $1,000.00.

Examination of Patients

ORIGINALLY it was the custom of local unions to provide cash benefits to disabled members during periods of disability. This practice was later supplemented by the establishment of free periodic health examinations, in order to foster preventive medical practice. Thus, the workers are stimulated to make regular inventories of their health, thereby preventing possible future illness by the early discovery of minor physical defects which might otherwise have caused costly disability. At present the more liberal and financially sound groups permit the workers considerable medical service without direct cost to the patient. This is accomplished by certain local unions setting aside substantial medical credits to the accounts of workers. This makes available, in addition to ordinary clinical examinations, the many laboratory and diagnostic services required for thorough investigation of ailments.

Still further improvement in this health movement has been possible by arrangements for mass examinations of large groups of workers. Thus, in the x-ray surveys of the chest which were arranged with the Works Progress Administration and the Department of Health of New York City, as many as 6,000 to 10,000 workers were examined in one- or two-week periods. More recently, in a five-day period, in addition to a chest x-ray survey a mass examination survey for syphilis was made of about 1,500 workers (Local 132) where Wassermann and Kahn tests were performed.

Examination of Applicants

IN ADDITION to the examination of patients, the examination of applicants (which compares with pre-employment examinations in industry) is carried on at this institution.

All persons who undertake work in the garment industry in New York City must be examined at the Union Health Center if they intend to join any of the 19 groups which have organized health programs.

While there are many pathological findings among these applicants each year, only those who are found to have communicable or contagious diseases are rejected.

Defects discovered during examination are called to the attention of the applicant and advice is given concerning the remedy. After the applicant becomes a member, she has the privilege of using the services of the institution in accordance with the terms of the constitution and by-laws of that particular local union.

Examination for Disability

EXAMINATION at this institution is also made of claimants who have reported their disability. They are awarded cash by their union during the period they are unable to work. These members must be examined at regular intervals during the disability period. By means of this service, we are able to learn and record the illnesses that confine the worker to his home or to the hospital.

TABLE II.
TYPES OF MEDICAL SERVICE
Year 1941

TOTAL VISITS	115,335
Patient examinations	69,301
Applicant examinations	22,477
Sick benefit examinations	13,622
Total general medical examinations	31,273
Total specialist examinations	38,028
Total diagnostic examinations	7,515
EXAMINATIONS BY SPECIALISTS	
All specialist examinations	38,028
Eye	8,436
Ear, nose, and throat	4,487
Gastro-intestinal	703
Genito-urinary	3,071
Skin	1,649
Arthritis-rheumatism	1,993
Orthopedic	764
Proctology	752
Neurology	169
Tumor	215
Peripheral vascular	660
Allergy	15,093
Others	36
DIAGNOSTIC EXAMINATIONS	
All diagnostic examinations	7,515
X-ray	1,908
Laboratory	3,946
Urinalyses	(20,620)*
**Audiometer	27
Basal metabolism	732
Electrocardiogram	902
All physiotherapy treatments	6,246

*Not included in the Total.
**Installed December, 1941.

In Table II are recorded the number and type of examinations performed at the Union Health Center.

It will be observed that there are twice as many examinations made of workers described as "patients" as of "applicants" and "sick benefit claimants."

It is primarily the workers listed as "patients" who call for special discussion. These workers pay a nominal fee for medical service, if they do not belong to a local union having a health program which includes this service. Free or partially free service becomes available when health programs are established. These vary greatly among the 19 local unions which now have an organized plan for medical care.

By means of such a plan it has been found that, in one local union, as many as 148 per 1,000 members received treatment which was paid for by that local (Local 117), as compared with 69 per 1,000 members who paid for treatment themselves. In another local union (Local 91) where liberal medical service is offered, 106 out of every 1,000 members received medical care paid for by the local, while 17 paid for such treatment themselves.

From this data, and for economic reasons and because of the worker's need for such medical care, as much free service as is possible should be made available.

Findings among Ambulatory and Disabled Workers

AMONG the 8,500 workers in the Children's Dress Industry (Local 91) a comparison of the findings among patients and disabled workers is of special interest because a thorough investigation of most sick workers was possible. This union permits diagnostic and laboratory work to be done without direct charge to its members, and it urges its members to take advantage of the health service. The membership consists predominantly of females, the majority of whom are between 20 and 40 years of age. The younger members applied for medical care only when illness occurred, while the older members, many of whom are chronic invalids generally sought aid because of some complaint that required medical attention. There were 191 cases among the disabled, and 389 cases among the ambulatory patients during this period of observation.

In Table III it will be observed that the most frequent condition met with in both the disabled and ambulatory sick workers occurred in the respiratory system. It appeared in 22.6% of the ambulatory cases, if we combine the conditions observed in the lower respiratory with those of the upper respiratory tract (ear, nose and throat) whereas, in the disabled, the combined frequency was 18.9%. The first in frequency among the disabled workers was diseases of the gastro-intestinal tract, if we include surgical conditions of this system. This latter grouping occurred in the frequency of 14.7%; appendectomies were performed in the greatest majority of instances.

Traumatic conditions (6.8%) most of which were fractures of non-industrial origin, and non-surgical traumatic conditions (8.4%), totalling 15.2%, follow in the frequency among the disabled.

The next important groups of conditions among the ambulatory sick workers were found to be gynecological diseases, gastro-intestinal disorders and rheumatic and arthritic conditions.

The presence of cardiovascular disease high in the list of frequency in both ambulatory and disabled workers is to be noted. Complaints of neurotic origin determined after careful investigation were frequently met with in the ambulatory worker.

The medical service now rendered to this group is unusually liberal. The worker pays but 35 cents a month, or $4.20 annually, for which he receives $7.00 per week for 10 weeks in cash benefits, in the event of disability. Should the illness require hospitalization, an additional allowance of $1.00 per day for the first 21 days is added to the cash benefits awarded. Sanitarium care is offered to those found to be afflicted with active pulmonary tuberculosis. In addition, up to $10.00 in medical credits for services at the Union Health Center is allowed to all members. This amount permits considerable medical service and medicine, on the basis of the low rate of charge at the institution.

This service is available to all members, regardless of the defects that may be present on their admission to the union.

While this program may be actuarially unsound, it is possible in practice because of numerous factors. There is an annual turnover of members of about 20%. The young member does not generally take advantage of preventive medical features made available, although there has been an increase from 5 to 10% in application for periodic health examination during the last five years.

The benefits of such a liberal program in time should develop an increased interest in maintaining good health, and thus reduce disability periods.

TABLE III.
LOCAL 91, for 1937
COMPARATIVE FREQUENCY OF CONDITIONS AMONG TOTALLY DISABLED AND AMBULANT SICK WORKERS

Condition	Disabled	Ambulatory
Respiratory diseases	14.7%	9.2%
Trauma (non-surgical)	8.4	3.6
Cardiovascular diseases	7.9	6.2
Skin conditions	6.8	5.1
Gynecological conditions	6.3	8.0
Gastro-intestinal (non-surgical)	5.2	8.2
Rheumatic-arthritis conditions	4.7	8.2
Genito-urinary diseases	4.2	1.8
Ear, nose, throat conditions	4.2	13.4
Eye conditions	3.1	5.4
Tuberculosis (pulmonary)	3.1	0.3
Endocrine disturbances	2.6	5.2
Hernia	1.6	1.0
Breast tumors	1.0	...
Neurosis	...	8.2
Lues	...	2.1
Allergy conditions	...	3.6
Gastro-intestinal (surgical)	14.7	...
Trauma (surgical)	6.8	...
Others	4.7	10.5
Total	100.0	100.0
Total frequency	191	389

Eye Survey

INASMUCH as needle-workers use their eyes to such a great extent, free eye examinations and eyeglasses were offered to 3,300 corset workers (Local 32). The health fund of this union received only 190 applications for examinations.

The majority of workers in this craft are women between 20 and 40 years of age who, as a rule, work 52 weeks during the year, and therefore are in better financial position than most garment workers.

Most of those who took advantage of the opportunity were girls who had worn glasses previously and therefore were interested in re-examinations. Very few sought examination unless they had some specific trouble with their eyes or had been especially advised to have them examined. Of the group examined, 72% had had visual defects in the past. Of these, 45% wore glasses, and only one-half of those who wore glasses had had their vision tested within three years. Only 27% of the last group were equipped with lenses which the ophthalmologists considered as satisfactorily correcting their vision.

The following conditions were found upon examination:

Condition	Cases	Per Cent
Myopia	21	11
Hyperopia	17	9
Astigmatism	54	29
Presbyopia	25	13
Conjunctivitis	11	6
Eye muscle strain	10	5
Other conditions	16	8
Negative cases	36	19

Sick Benefit Claims and Disability

MUCH data in connection with disability has been gathered and published by the writer.*

During the past five years, from varied groups comprising 10 to 16 local unions, with an insured membership of approximately 86,000 to 103,000 persons, the annual claim rate varied from 5.0 to 5.5 per 100 members (as seen in Table IV).

The average disability fluctuated from 30 days in 1937 to 38 days in 1941. This is in part influenced by the fact that unions with older age groups joined this sickness insurance system, and because payment for some conditions originally excluded are now compensable.

The rate of denials decreased from 12.3% in 1937 to 9.7% in 1941. In one group (Local 117) consisting of tailors mostly over 40 years of age where there was a comparatively high prevalence of illness, the claim rate was 6.8 per 100 members, the denial rate comparatively low (5.6%) and the average disability comparatively high, 46.5 days. The hospitalization incidence was more than 50% among these sick benefit claimants, pointing to the serious and disabling nature of the illnesses experienced.

TABLE IV.
SICK BENEFIT MEMBERSHIP CLAIMS FOR DISABILITY
1937-1941

Year	No. of Locals	Insured Membership	Claim Rate	Denial Rate	Average Disability in Days
1937	10	86,545	5.06%	12.3%	30.0
1938	13	92,116	5.09	11.8	35.4
1939	15	102,127	5.00	11.9	37.3
1940	16	99,170	5.20	12.5	39.9
1941	16	103,238	5.50	9.7	38.2

A large portion of the older-age garment workers apparently are chronic invalids whose economic status requires them, in spite of their poor health, to work during the two limited busy seasons of the year. Their work, however, is frequently interrupted by disabling illness. As soon as the season is over or is slow, with a consequent reduction in earnings, they stop work and seek the medical care they require. Many are in such condition that they are advised to rest or to arrange for operations that had been previously suggested during the work season. The low claim rate for disability is apparently not a true gauge of the extent of sickness among this older group and their disability period is long and the character of illnesses as a rule, serious.

Tuberculosis

FROM the very inception of the Union Health Center the tuberculosis problem received special attention. In 1913 the U. S. Public Health Service, employing most careful clinical methods of investigation (exclusive of x-rays) disclosed the presence of tuberculosis in 3.11% of the males and 0.9% of the females in a group of about 3,000 garment workers (U. S. Public Health Bulletin No. 71—1915).

From 1913 to 1934 the only means of discovering this disease was during the course of routine examinations of patients coming to the Center. Since 1934—with the development of the sickness insurance and provision for more free medical service—more thorough investigation was possible and permitted the use of x-ray and laboratory examinations without cost to the patient. This naturally resulted in the finding of many more active cases.

As previously stated, the Works Progress Administration and the New York City Department of Health, in 1939, offered industrial workers the opportunity of having x-ray examinations of the chest performed. Thus, in the year 1939, 24,000 garment workers were examined; in 1940, 2,043; in 1941, 7,079; and during the first three months of 1942, 1,532 have already had their chests examined by x-ray.

In the first survey of 24,000 workers in different crafts, the incidence was 2.3 per 1,000. The Union Health Center, after exhaustive study, diagnosed 57 of the many cases under observation as active. As many as 449 cases of inactive pulmonary tuberculosis were also found and placed under permanent supervision; heart and circulatory conditions were discovered in 111 workers and there were 27 miscellaneous conditions all of whom were given attention.

The larger proportion of tuberculosis cases occurred among women under 30 years of age. Most of the subjects over 40 years were male members. More than two-thirds of the cases of tuberculosis occurred in married patients.

The majority of the younger age groups were found to be early cases. Among the older age groups—men over 45—we found, in most instances, far advanced tuberculosis, with a poor prognosis, who became a serious problem, because so little can be done for them by sanitarium care. Upon discharge, although they had positive sputum, they persisted in seeking work in the industry.

Two groups have had their members participate in a second x-ray chest survey. Among 8,500 workers in the Children's Dress Industry (Local 91) 82% of the members were x-rayed during the 1939 survey, and in the second (1941) 80% were x-rayed. The incidence among the examined members dropped from 2.0 per 1,000 to 1.3 per 1,000 during these two years.

Members found to have active tuberculosis were offered benefits in the form of sanitarium care in affiliated institutions for the duration of their disability. It has been found that about 53% of the tubercular patients returning to the trade were away from work less than one year, 21% from one to two years, while 8% lost more than two years. Some did not return to the industry, and about 9% died.

During 1941 the privilege of working under control was given to 153 of arrested tuberculosis cases and 45 new cases were discovered in the routine medical service of the Center.

Findings among Hospitalized Cases

SICK benefit claimants numbering 2,262, 2.28% of the insured membership of 99,170 were hospitalized during 1940.

Of these, 68% were women and 32% were men. The records of 2,192 patients who were discharged in 1940 reveal that they spent 36,411 days in 198 hospitals.

Of those hospitalized, 30.2% were between 40 and 49 years of age, and 26.6% between 30 and 39 years.

*Report on the Medical Administration of Sick Benefits to Dressmakers Union, Local 22, International Ladies' Garment Workers Union; Report for 1937 on the Sick Benefit Plan of the Children's Dress, Infants' Wear, Housedress and Bathrobe Makers' Union, Local 91, International Ladies' Garment Workers Union; Health Program of International Ladies' Garment Workers Union published in the Monthly Labor Review, October, 1939, of the Bureau of Labor Statistics, United States Department of Labor; Union Health Center Report 1913-1940.

The average hospital stay was 16.5 days; 58.4% were hospitalized two weeks or less; 79.4% for three weeks or less; 8.8% five weeks or more; and 1.6% for more than 10 weeks.

Further evidence of the serious character of the disabling illnesses that exist among garment workers is provided in the fact that out of every 100 workers claiming disability, 42.5 are hospitalized cases.

The largest number of admissions on any one day (May 24) was 150. The largest number of members were hospitalized during the months of May, June and July, the so-called slack season in the garment industry. The smallest number were hospitalized during the months of December, January and February. Although it is during these months that one finds a larger number of the general population in hospitals, the small number of garment workers hospitalized at this time is explained by their having their busiest working periods during those months when there is a higher incidence of illness. As a rule, arrangements for non-emergency operations are postponed until the slow season during the summer months.

Of 2,192 discharged cases 74.3% were surgical and 25.7% were medical cases.

Gynecological operations were performed in 24.9% of the surgical cases. Of all the women who were hospitalized those subjected to gynecological operations comprised 27.2%. Appendicitis operations were performed in 14.1% of the surgical cases. There were 88 operations for hernia, 85 for hemorrhoids, 77 for gallbladder conditions, 50 for removal of the thyroid gland, 40 kidney operations, 25 for the removal of breasts and 64 tonsillectomies.

Among 563 medical cases 76 had heart disease, 81 suffered from diseases of the digestive system and 79 had respiratory conditions, the majority being pneumonia. Kidney ailments occurred in 38, rheumatic conditions in 26 and pulmonary tuberculosis in 16. There were 29 cases of inoperable cancer.

Conclusion

THE data accumulated from periodic and other examinations and surveys of garment workers reveal that there are groups of workers in some crafts who, because of increased age, have been found to have a high incidence of chronic ailments which, although in themselves not totally disabling, nevertheless produce inefficiency and frequent disability. Because the nature of the industry does not require special physical vigor and because the industry has seasonal variations permitting rest periods, the worker suffering from chronic illness can earn a livelihood in spite of impaired health. The garment industry has recently included numerous allied crafts in which many young workers are employed. The findings of this group reveal the defects and negligent health practices that are customarily found among persons earning low wages.

There is need for making available to workers an opportunity for medical aid at low cost. This may assure garment workers shorter periods of disability and escape from prolonged illness.

There should be an assurance that the discovery of illness will in no way prevent re-employment.

The use of survey methods such as x-rays of the chest, blood Wassermanns, blood counts, electrocardiograph examinations, urinalyses, and other diagnostic measures seems to be the most promising means of examining large groups for the specific purpose of eliminating or discovering the presence of certain diseases. Such methods arouse the worker's interest in taking part in surveys to discover diseases that may be disabling and are commonly known to the working population.

Summary Comment

SINCE 1913 the garment workers have gradually evolved a health program giving their members an opportunity to receive good medical care.

The cost of this medical care is so distributed among the worker and the local union and the international organization that the cost burden is eased for the workers.

By the development of various sickness insurance plans much free service is made available.

Sickness insurance is the influencing factor in preventive health measures offered the workers, who also receive cash benefits during periods of disability.

The health programs permit many of the local unions to take advantage of mass health surveys and these seem to be the most promising method of stimulating investigation of the workers' health. The low incidence of tuberculosis is evidence of a prolonged program of medical supervision.

Respiratory Infections

—Prophylaxis with Oral Water-Soluble Antigenic Substances—

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THE problem of reducing industrial disability and inefficiency due to the common cold is of vital importance in the present critical period. A recent survey conducted by the American Institute of Public Opinion indicates that one-half of all work time lost in war industries is lost because of the common cold. During the seven days ending February 24, 1942, colds were reported in nearly two-fifths of American homes, with an estimated total of 23 million persons afflicted. A previous survey by the Institute has shown that in industries connected directly or indirectly with war production approximately 3,200,000 man-days of work were lost because of illness during the four-week period ending December 20, 1941. The common cold accounted for approximately one-half of this illness. Lanza[1] estimates "conservatively" 45 million workdays are lost each year as a result of colds and acute respiratory infections. This is the equivalent of the full-time work of 150,000 persons throughout an entire year.

The total economic loss to workers—including wages and medical costs—is estimated at $400,000,000 yearly, and employers lose an equal amount according to conservative calculations.

The promise of oral immunization against the common cold has been amply confirmed during several years' experience in spite of the theoretical objection that the normal intestinal mucosa might hinder adequate absorption of antigens. A survey of the history and development of oral immunization and the results obtained by many investigators establish beyond question the value of this method.

Many attempts at oral vaccination against various diseases were made in the latter part of the nineteenth century; however, accurate clinical reports became numerous in the early 1920's.

Antidiphtheritic serum was used orally by Lafour,[2] who claimed results were as successful as those obtained with injectable antisera.

Oral vaccination against bacillary dysentery and Malta fever with promising results was reported by Nicolle and Conseil[3] in 1922. Enlows[4] (1925) reported some indication of immunity following oral vaccination against bacillary dysentery, and mentioned that the danger and discomfort of subcutaneous vaccina-

tion against the Shiga type made oral vaccination worthy of trial.

Besredka,[5] of the Pasteur Institute, was a leader in the field of oral immunization and reported excellent results with the use of an oral antityphoid vaccine. He combined the vaccine with bile, contending that irritation of the intestinal mucosa was necessary for efficient absorption of the oral antigen.

Fornet[6] refers to Hida and Toyoda who demonstrated that cholera, typhoid and dysentery bacilli do not lose their immunizing power when subjected to gastric disgention.

During this period (1925), several reports appeared in the literature showing oral immunization to be of value, but less effective than the subcutaneous type of administration.

Promising results in both animal and human immunity to pneumococcus infections were reported by Ross[7] in 1930. No specific agglutinins or precipitins were formed in rats, although pneumococcic immunity could be demonstrated by serum transfer in mice.

One of the first comprehensive papers reporting results of the use of oral cold vaccines was presented in 1935,[8] although the authors mention similar work by Powell in 1926, 1932, and 1933. The vaccine was prepared in capsules each of which contained in the dry form 100 billion each of a rough pneumococcus and a streptococcus. Five hundred patients were vaccinated and an additional 536 were studied as controls. The vaccinated group showed a 57% reduction in the number of colds, whereas the controls showed a 12% decrease.

In 1937 Toomey[9] reviewed the literature on oral vaccine therapy and concluded that heterophile antibodies were produced during acute colds. This author postulated that protection might be obtained against future colds, or at least against the secondary infections which complicate colds.

Rockwell, VanKirk, and Powell[10] in 1937 reported their results using a heat-killed, dried vaccine composed of 25 billion pneumococcus organisms, five billion H. influenzae, 15 billion streptococcus, and five billion M. catarrhalis. There was a 67.7% reduction in the number of colds ordinarily experienced by the experimental group, while four times as many colds occurred in the control group. An enteric coated tablet of purified scarlet fever toxin was reported to be 94.7% effective by Dick and Dick[11] in 1940.

Piccoli,[12] in 1940, reported statistics on 3,000 orally immunized individuals and an equal number of controls. Results showed four times as many colds in the control group as in the vaccinated. Accepting the fact that colds may be caused by viruses, by bacteria, or by a combination of both kinds of agents acting upon the same individual, and that virus colds are mild whereas the most severe illnesses result from bacterial infections of the upper respiratory tract, he re-emphasized the value and importance of immunizing against the common predominating organisms of the nasopharyns, consisting of H. influenzae, streptococcus, staphylococcus, pneumococcus, M. catarrhalis and B. friedlander.

Stafford,[13] in a controlled study using enteric coated oral vaccine tablets, found that the vaccinated group showed only one-fifth the number of colds encountered by the control group. He administered tablets containing the soluble antigenic derivatives of the bacteria commonly found in the respiratory tract. Murat[14] alternated individuals in attempting to control his series. The group receiving placebos proved more susceptible to colds than the immunized group.

Palmer and Andes[15] report the use of the soluble antigenic fractions of the common bacterial inhabitants of the nasopharynx in both immunization and treatment. Therapeutic use in acute upper respiratory infections showed excellent results in the hands of these workers, and effective prophylactic administration by the oral vaccine is also reported.

Management Review[16] outlines several reports from industrial organizations showing the effective use of oral vaccine in reducing "time hours lost" from 60% to 80%.

WITH the above information at hand, the present study was inaugurated in an attempt to evaluate the efficacy of oral immunization among a limited group of workers at Washburn-Crosby Mills, Minneapolis, Minnesota.

"Vacagen" oral cold vaccine tablets, containing the water-soluble antigenic substances derived from the common bacteria associated with infections of the upper respiratory tract were chosen for this investigation. The soluble antigenic fractions of pneumococcus (Types 1, 2, 3,) streptococcus (hemolytic, non-hemolytic, and viridans), H. influenzae, M. catarrhalis, Staphylococcus aureus, and Friedlander's bacillus are lyophilized (rapidly frozen and desiccated under the high vacuum), incorporated into tablets, and enteric coated for oral administration.

Accurate administration was arranged as follows:

A group of 450 men was selected and each was given one tablet per day for seven days and two tablets per week thereafter. On certain specified days a registered nurse was instructed to supply to the foreman of each crew in this group the proper quantity of tablets needed for that day. As the men punched the time clock, each was supplied with a tablet and a cup of water. This schedule was put in effect November 15, 1941, and continued until April 1, 1942, a total of 20 weeks.

There were no indications of undesirable reaction or irritation following the administration of these tablets.

Our records are arranged so that we have available accurate information as to the number of working days lost by each individual during the past years. During the period from November 15, 1940, to April 1, 1941, this same group of individuals lost a total of 225 working days due to upper respiratory tract infections. After immunization, November 1, 1941, to April 1, 1942, the total loss from similar infections was reduced to 33 working days. This results in a reduction of 85.3% in time lost from work.

The obvious benefits in increased efficiency of operation and production in any industrial organization presenting the problem of upper respiratory infection recommends the routine administration of this antigen. It must be emphasized, however, that an accurate method of administration be arranged and supervised.

Summary and Conclusions

THE routine administration of "Vacagen" oral cold vaccine tablets appears mainly responsible for a reduction of 85.3% in work days lost at Washburn-Crosby Mills, Minneapolis, Minnesota.

2. Accurate and supervised administration is recommended.

3. No undesirable reactions or irritation were observed following administration of this antigen.

4. These results appear to warrant the routine application of such immunizing procedure to all industrial workers.

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Dermatitis

—Occurring Among Operators of Air Conditioning Equipment—

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THIS investigation was undertaken to determine the cause of dermatitis reported to be prevalent among operators of air conditioning equipment used during the summer months to keep the air in large buildings at the proper temperature and humidity. Equipment operators generally believe that the chromate solution used for cooling and humidifying the air taken into the buildings, and the refrigerant used in the chilling of this chromate solution represent special skin hazards. As so frequently happens when a special occupational skin hazard is presumed to exist, operators are inclined to attribute all skin eruptions, regardless of site or nature, to exposure to one or both of these substances.

Description of Process

THE air conditioning process and equipment operated by the workmen examined in this study are as follows:

The process consists essentially of a recirculating system containing water which is chilled at one point in the system by a refrigerating apparatus, and which is then sprayed through the air being taken into the building at another point in the system. To counteract the corrosive action of this recirculated water on piping, especially the tubing in the refrigerating equipment, a chromate solution is added, consisting of sodium chromate and sodium dichromate) in sufficient quantity to maintain 200 parts per million in the system.

The refrigerating apparatus is located in the engine room in the basement of the building. Here the water of the air conditioning system is cooled to around 42-43° F. After being chilled, the water is pumped to spray rooms on the top floor of the building. These spray rooms are about 8 x 10 ft. and about 10 ft. high. The room is copper lined throughout and can be entered for cleaning through a small water-tight door located in one wall of the room. A vertical bank of sprays is located on each side of the room, and outside these are vertical banks of metal baffle plates. The chilled water of the air conditioning system is ejected through spray nozzles toward the center of the room and the air to be conditioned is blown through this spray. The baffle plates remove the excess water from the cooled air as it leaves this room to be carried throughout the building.

A dosing tank is located on the top floor of the building where sodium chromate and sodium dichromate can be added to the air conditioning system to maintain the concentration of these compounds at 200 parts per million. Each morning a workman takes a sample of water from the system and determines the concentration of chromium salts by a quantitative chemical test. He then draws the indicated amount of concentrated chromate solution from a drum into an open container and pours it into the dosing tank. This concentrated solution is diluted with water in the dosing tank and then run into the air conditioning system through a valve. The workman carrying out this procedure is supposed to wear rubber gloves. That some of the chromate solution is dripped and splashed outside the tank, and possibly on the clothes of the workman, is evidenced by the yellowish-orange stain on the floor around the dosing tank.

The refrigeration apparatus consists of a closed compression system. The refrigerants being used in the equipment operated by the workmen examined in this study were either dichlormethane or dichlorodifluoromethane. The refrigerant, of course, does not come in direct contact with the water of the air conditioning system. It is vaporized in a system of tubes around which the water of the air conditioning system flows to become chilled. The refrigerant is again liquefied by means of compression pumps, and the heat of compression is taken up by a flow of water jacketing the compression system. In some buildings this water was obtained from a nearby body of water and wasted after it had served its purpose. In other buildings the water for cooling the refrigerant during compression was held in a recirculating system and used over and over again. In these installations the water, after taking up heat from the compressed refrigerant, is pumped to a spray room where it is ejected through spray nozzles and subjected to circulating air for cooling. The water is then returned again to the compression system. In these systems using recirculated water, chromate is also added to prevent corrosion.

It was difficult to determine how much exposure to the chromate solution and the refrigerant was experienced by each workman. There is a certain amount of rotation through the various jobs connected with operating the air conditioning equipment. The exposure is seasonal, since the equipment is used only for humidifying the air during the winter months, and chromate is not added to the water during this period in the equipment of most of the buildings. Also the workmen vary considerably in the precautions they take in avoiding contact with the chromate solution, refrigerants, etc.

The possibility of chromate solution being spilled or splashed during the addition of the concentrated chromate solution to the air conditioning system has been mentioned. It is quite likely that a careless workman might get some of this on his clothes or skin. None of the workmen, however, was found to have "chrome

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ulcers" which might be expected to result from cutaneous exposure to the concentrated solution.

During the summer months the spray rooms have to be cleaned about once a week. The men are supposed to wear rubber boots and gloves to protect themselves from the chromate solution while cleaning the spray rooms. During the operation of these spray towers several inches of the air conditioning water collects in the bottom of the room, and its return to the system is controlled by a valve operated by a float. Chromate salts are left deposited on the walls, sprays, and baffle plates in the spray room by water which has been taken up as moisture in the circulating air. In cleaning these rooms, the workmen first wash the walls of the room down with a hose while standing outside the room. Following this, however, it is necessary for the men to enter the spray room and scrub with hand brushes. Occasionally a workman is splashed with chromate solution on his clothing and skin, and occasionally some of the solution gets inside a rubber boot.

Workmen may also be exposed to chromate solution or precipitate in other rooms. Pumps are located at various points in the recirculating system—such as at the spray towers, and in the engine room where the solution is chilled—and a certain amount of the chromate solution works its way out through the packing of the bearings, leaks, etc. This is evidenced by the yellowish-orange precipitate of chromates seen on some of the pumps. The workmen are exposed to this chromate precipitate when working on the pumps, repacking bearings, etc. A concrete trench around the pumps also contains chromate solution that has leaked from the pumps or has escaped during repair work. Occasionally a workman inadvertently steps into this while working on the pumps.

The spray rooms in those installations using recirculated water to take up the heat of compression of the refrigerant also need to be cleaned occasionally. Possible exposure to chromates during this procedure would be similar to that in cleaning the air conditioning spray rooms.

During the winter months a certain amount of retubing and other reparative work is carried on which may entail skin exposure to chromate solution or precipitate. The fans that pull the air from the spray room occasionally have to be cleaned, and there is undoubtedly some chromate in this dirt.

Freon and carrene,* which are used as refrigerants, occasionally get on the skin of workmen taking care of the refrigerating equipment. Exposure would ordinarily be accidental and intermittent, such as when adding these chemicals to the refrigerating system, and from leaks around the compressors. The workmen also get a mixture of the refrigerant and lubricating oil on their hands when draining compressor pump crank cases. Some of the workmen stated that they have at times used this oil and refrigerant mixture to wash excess grease from their hands.

In the wash rooms, in addition to ordinary soap, a mechanic's abrasive soap was available for removing grease and dirt. Some of the workmen stated that they frequently used kerosene.

Examination of the Workmen

IN ORDER to determine the incidence of dermatitis among the air conditioning equipment operators, an examination was made of all the workmen who could be contacted. One hundred and five were examined in all, leaving only four or five of the whole group that were not seen. The examination consisted in the taking of a brief history as to length of employment, type of occupation, chemicals to which the worker has skin exposure and the nature of the exposure, skin diseases experienced by the worker in the past, and a physical inspection of the hands, forearms, face, neck, and feet for evidence of cutaneous lesions. The findings from these examinations are shown in Table I. The total of the percentages in the table exceeds one hundred, since 26 of the workmen had two of the conditions in the list of diagnoses, and four had three of these conditions.

Thirty of the workmen had no skin lesions of the areas inspected at the time of examination. Six had skin diseases that were unrelated to their occupation, such as tinea versicolor, acne rosacea, psoriasis, papillomata, seborrheic keratoses, etc.

TABLE I.
FINDINGS ON EXAMINING 105 OPERATORS OF AIR CONDITIONING EQUIPMENT FOR EXISTING OR PAST SKIN LESIONS

Clinical Diagnosis	Number	Percent of Total
1. No skin disease present	30	28.6
2. Skin of hands dry and defatted	17	16.2
3. Dermatitis—possibly occupational	5	4.8
4. History of dermatitis—possibly occupational	8	7.6
5. Clinical dermatophytids of hands	7	6.7
6. Dermatophytosis of the feet	66	62.9
7. Other skin diseases	6	5.7

*Many workers had more than one skin disease.

Nearly 30% of the workers had, or gave a history of having had, a dermatitis which was related to their work (includes diagnoses numbered 2, 3, and 4). The skin of the hands of 17 men showed skin changes typical of the use of strong hand cleaners and solvents—such as dryness, chapping, thickening, and fissuring. Many of these men stated that kerosene was frequently used to remove excess grease from their hands. Five of the men examined had, at the time of examination, dermatoses which clinically were considered to be of possible occupational origin. Four of these had very similar conditions which were unilateral, involving the lower leg and ankle. The eruption in each instance consisted of a large, confluent, lichenified, erythematous area, with a few scattered vesicles, some of which were broken, and scratch marks. The fifth workman with a dermatitis that was considered to be possibly occupational, clinically had dermatophytosis of the feet with dermatophytids of the hands complicated by a contact dermatitis. The palms showed many minute ulcerations as though an irritant substance were applied to the broken vesicles of the dermatophytid eruption. This individual also had a moist erythematous, maculo-papular eruption involving the anti-cubital spaces, with scattered lesions over the arms, legs, and on the trunk.

Eight other workmen gave histories of having had dermatitis which they attributed to chemicals encountered in their work. The description given of their dermatitis by these individuals makes it doubtful, however, whether all these eruptions could be attributed solely to occupational exposure to chemicals.

The incidence of dermatophytosis among the whole group of workmen examined is difficult to estimate accurately from the clinical findings alone. A certain amount of peeling and cracking was found in the interdigital spaces of 62.9% of the men. This varied from the presence of slight peeling in the fourth interspace of the toes on 24 workmen, and definite cracking and peeling of the skin in several interspaces of the toes on 20 workmen, to marked cracking and peeling in several interspaces, with active lesions showing deep-seated vesicles in most instances in 22 workmen. On the whole, the foot hygiene of the men, as observed during the examinations, is in need of improvement. Hyperhydrosis, dirt, and continuous wearing of a single pair

*Freon is dichlorodifluoromethane. Carrene is dichlormethane.

of old shoes provide ideal circumstances for fungus infections and these factors may contribute to the prevalence of dermatophytosis in this group. In some instances more than one person uses the same rubber boots and gloves. This practice could very well contribute to the spread of fungus infections to workers uninfected. Seven of the men examined had what appeared clinically to be dermatophytids of the hands as well as dermatophytosis of the feet. This eruption, in one instance, appeared to have a superimposed contact dermatitis. In other cases, the use of strong skin cleansers and solvents complicated the condition.

Patch Tests

A PATCH TEST previously performed with Freon on one of the affected workmen gave no reaction. This compound is extremely volatile and workmen handling it would have only intermittent and usually accidental skin exposure. In addition to this, most of the 13 workmen who had a dermatitis of the contact type at the time of examination, or who gave a history of having had a dermatitis, possibly of this type (included in diagnosis numbered 3 and 4 in Table I) were not exposed to the refrigerant. All of them had more or less exposure to the chromate solution. It was thought, therefore, that the chromate solution was the principal skin hazard and the most likely cause of occupational dermatitis among the operators of the air conditioning equipment. The refrigerant and crank-case oil mixture used occasionally by some of the workmen to remove excess grease from their hands may have contributed, however, to the defatting of the skin of the hands of some of the 17 workmen included under diagnosis No. 2 in Table I.

Patch tests were performed on 10 of the 13 individuals having or having had a possible occupational dermatitis (included under diagnosis numbered 3 and 4 in Table I) with a solution containing sodium chromate and sodium dichromate. A 3% solution was used in all but one case, and in this instance a solution containing 200 parts per million was used. Of the 10 that were patch tested, four had a dermatitis at the time of examination, and six were from the group of workmen giving a history of a dermatitis that was possibly occupational in origin. Of the four with dermatoses, one gave a very marked reaction to the patch test, with a flare up of the skin areas involved by the dermatitis; one gave a questionable reaction; and two gave negative reactions. One of those who gave negative reaction was patch tested with the solution of chromate containing 200 parts per million, which may have been too dilute a solution to cause a reaction in his degree of hypersensitivity. This individual is the one previously described as appearing clinically to have a dermatophytid with a superimposed chemical irritation manifested by small ulcers scattered over the palms of the hands as though they had occurred at the sites of previous vesicles. If this were the case, the superimposed chemical dermatitis was due to the action of the chromate as a primary irritant and not due to hypersensitivity.

Of the six workmen patch tested who gave histories of dermatoses that were possibly occupational in origin, two gave mild reactions (1 plus) and four gave no reactions.

Fifteen of the entire group of 105 workmen examined stated that they had never come in contact with chromate solution because of their short period of employment at the time of examination, the nature of their work, or the special precautions they took to avoid such contact. The patch test results revealed that three or possibly four of those having, or giving, a history of having a dermatitis that might have been of occupational origin were hypersensitive to chromate. Thus 4.4% of those exposed to chromate developed cutaneous hypersensitivity.

Conclusions

OF THE 90 workmen who state that they have had more or less cutaneous exposure to chromates, approximately 14% have or have had dermatitis attributed to this cause. The patch tests performed, however, indicate that probably not more than 5% of the workmen have cutaneous hypersensitivity to chromates.

2. The incidence of dermatophytosis, clinically, among the workmen examined was approximately 63%. Dermatophytids of the hands were found in seven (6.7%) of the workmen, some of these eruptions being complicated by irritation from substances encountered during work.

3. Sixteen percent of the workmen showed dryness, fissuring, and thickening of the skin of the hands, which was thought to be caused by the use of strong hand cleansers and solvents.

4. The majority of the skin diseases found were not of occupational origin. Fungus infections of the feet and dermatophytids of the hands were responsible for most of these, with a few cases of other non-occupational skin diseases making up the rest. The occupational skin diseases, including those caused by solvents and skin cleaners and those resulting from exposure to chromates, represented about 20% of all the skin diseases found.

Recommendations

SINCE some workmen will become sensitized by skin exposure to the chromate solution used in air conditioning equipment, it is recommended that exposure to this solution be reduced to a minimum. All operators of air conditioning equipment should be impressed with the potential danger of exposure to chromates and should be required to use the protective equipment described below (under 2) whenever they have to work where chromate solution or precipitate is present.

2. Each workman who has any occasion to expose himself to the chromate solution, should be furnished a pair of rubber gloves and boots for his individual use. Aprons and sleeves made of a suitable water-proof material (the synthetic resin films such as koroseal, vinylite, or pliofilm are especially well suited for sleeves) should be provided for those engaged in such operations as washing down spray rooms, cleaning fans, repacking water pumps, or any other operation entailing a general exposure to chromates. After engaging in work of this type workmen should be required to wash all exposed parts thoroughly and change any clothing that may have been soiled with the chromate solution or precipitate.

3. The practice of using kerosene, refrigerant-oil mixture, and other solvents for hand cleansing should be forbidden. A mild soap, or a cleanser composed of one of the wetting agents and sulfonated oils,[1] as a more effective and less irritating detergent for removing grease, should be furnished. Workers inclined to have dry skins that chap easily should use a suitable preparation of animal or vegetable fats and oils (such as equal parts of lanolin and cold cream) on their hands after cleaning up from the day's work.

4. Workmen should be urged to practice better foot hygiene. Shower baths should be taken after work, the workmen wearing individual bathing slippers to pre-

1. SCHWARTZ, LOUIS: A new industrial skin cleanser. Public Health Reports, 56:1788-1790 (Sept. 5) 1941.

vent contact with shower room floors. Workmen should provide themselves with at least two pairs of work shoes so that they can begin each day with a dry pair of shoes. Workmen having dermatophytosis of the feet should be urged to seek medical advice.

Acute Brain and Spinal Cord Injuries

—Patho-physiological Considerations in Relation to Therapy—

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THE rational treatment of brain and spinal cord injuries must be based on an understanding of fundamental patho-physiology. As our knowledge of basic processes increases and we learn more concerning the physical forces involved, our clinical concepts undergo modifications. So will also our prevention and treatment of these injuries.

Brain Injury

THE NATURE OF CEREBRAL CONCUSSION AND DIFFUSE CEREBRAL CONTUSION:

At the outset it is advisable to discuss cerebral concussion because this condition is the commonest type of brain injury and forms a base, so to speak, upon which most of the other kinds of brain injury are superimposed.

The clinical attributes of human cerebral concussion are well known. The essential symptom is a partial or complete loss of consciousness, or other derangement of consciousness, such as delirium, transient confusion or a brief period of depersonalization directly following head injury. Other signs of concussion may be attributable to shock with vasopressor collapse, or to concussive effects on cardiac, respiratory and vasomotor centers in the brain stem.

Why is the brain (and to a lesser degree, the spinal cord) so easily concussed? In the case of the brain and spinal cord we are dealing with more or less solid viscera surrounded by a thin fluid layer, closely encased in a fairly rigid bony box. When the brain is shaken up and/or the skull is momentarily deformed by the impact of a powerful force, the brain cannot translate the force into motion, i.e., the brain cannot move away in the intracranial cavity. This seems quite obvious, especially if one compares the brain with a hollow viscus in the peritoneal cavity. Concussion of the stomach does not exist because this viscus can easily change its shape within itself or be moved about freely in the peritoneal cavity. The brain is more or less fixed and must take up the force of the shaking or blow if these are not "absorbed" by cranial bones or the intermediation of other protective agents.

The next question is what constitutes the ultimate structural basis of cerebral concussion. This brings up the general pathology of brain injury—a complicated chapter in itself. A rich variety of tissue changes has been described—capillary and larger sized hemorrhages in the brain and meninges and in the epidural, subdural, and subarachnoid spaces and in the subpial tissues, venous congestion and/or cerebral edema, and a variety of degenerative and reactive changes in the cerebral parenchyma and glial supporting tissues. In this connection the parts played by increased intracranial pressure and cerebral anemia (or anoxia) also must be weighed. Amongst this welter of tissue abnormalities, what causes the phenomena of cerebral concussion? Some light has been thrown on the matter by two observations—first: in many instances of cerebral concussion the individual quickly and completely recovers; second: in a few cases death shortly follows upon the receipt of severe head injury and no cerebral pathology is disclosed which can satisfactorily account for the patient's death. In other words, we see transient and quickly reversible reactions leading to recovery, and the opposite extreme—a rapidly progressive and fatal outcome. These considerations have led students of the subject to the belief that the signs of cerebral concussion are due to direct, widespread physical effects on cerebral neurones, producing a paralysis of nervous function. This view is given further support by the fact that degenerative changes have been described in spinal cord neurones due to concussive trauma. The exact nature of these cellular changes is not fully defined. When one considers the unique structure and function of central neurones—nerve cells operating in highly complicated reflex circuits with far-flung processes sometimes extending many inches from their cell-base—structures compactly set in a solid medium—one should expect that such cells are susceptible to the effects of physical stress.

In contradistinction to this primary neuronal pathology, Denny-Brown and Russell[1] apply the term "cerebral contusion" to injuries sustained by the vascular and supporting tissues of the brain. These may affect the structure and function of the nerve cells secondarily to bring about symptoms and signs which accompany or complicate those due to cerebral concussion.

There are several other questions which arise in connection with the concept that cerebral concussion is due to the effects of physical stress on cerebral neurones. In the frequent cases of *transient concussion*, in which a brief period of unconsciousness or a dazed state are followed by complete and rapid recovery, the disordered function of the cells is quickly righted, i.e., the process is a reversible one. When unconsciousness or traumatic stupor or traumatic delirium are prolonged for hours or days, are we to regard these symptoms solely as the result of neuronal concussion as above described, or are vacular and other lesions in the supporting tissues (i.e., diffuse cerebral contusion) also playing a part in injuring the nerve cells? In a given case this question cannot be immediately answered. However, if recovery is finally and completely attained, one *may* be correct in assuming that the state of cerebral concussion was a prolonged one, and that abnormal vascular and other extraneuronal factors played little or no part in the production of symptoms. On the other hand, when recovery is imperfect and such sequels as persistent headache, dizziness, memory defect, inadequate concentration, irritability and change of personality occur, one may be sure that cerebral contusion has occurred, but one cannot say that *all* these symptoms are the result of cerebral contusion (i.e., effects on cerebral neurones brought about by the lesions in the cerebral vascular tree and supporting structures) and that some signs pointing to defective nervous function might not represent the after-effects of the physical (conclusive) stress on particular groups of nerve cells.

For purposes of clinical study, one might divide acute cerebral concussion into: (a) *Transient Concussion*, i.e., the very common stunning or brief loss of consciousness, quickly followed by complete recovery; (b) *Prolonged Concussion*, in which unconsciousness, stupor or delirium last for hours or days, unassociated with any signs of focal brain disease or

Read at a meeting of the ASSOCIATION FOR ADVANCEMENT OF INDUSTRIAL MEDICINE AND SURGERY, New York, April 27, 1942.

heightened intracranial pressure, and in which a gradual but finally a complete recovery is attained; (c) *Fatal Concussion,* in which death quickly follows receipt of a severe head injury. In these cases the abnormal changes in the brain tissues as studied by present-day methods are quite inadequate to explain the fatal outcome (there being no lesions elsewhere to explain it, either).

The Prevention of Head and Brain Injury

THE recent studies of Denny-Brown and Russell throw further light on the nature of the external forces which cause brain injury. They point out that there are two types of cerebral concussion: (a) acceleration concussion,—this is produced by "the stress clearly derived from the inertia of the brain when the head is accelerated from its momentum when decelerated . . . the effect produced is directly proportional to the velocity of the striking object." The essential factors in the operation of this type of trauma are the quick application of the force producing the acceleration and then the speedy cessation of the force's action. (b) The second type, which they describe as "compression-concussion," is much less common and is brought about by momentary distortion of the shape of the skull, the compression being sufficient to cause fracture, mostly of the depressed type.

In both of these types of concussion, the *rate* of physical change is of paramount importance, and the effects on the brain must be of a *generalized* nature. Denny-Brown and Russell point out again that in the case of a small area of impact with penetration of the skull, the victim will not suffer from cerebral concussion even though he sustains local contusion or even local laceration of the brain. In going through the skull, the force of acceleration is much reduced, and the small area of impact focalizes the effects of the injury.

The wearing of special headgear, to diminish the acceleration of the injurious force and to prevent compression of the skull, is the most obvious direct preventive measure as far as the victim is concerned. A light metallic helmet lined with a thin layer of some kind of absorbent material such as mesh rubber or felt closely applied cap-like to all parts of the head would seem to answer the purpose.

Treatment of Cerebral Concussion and Contusion

IN A GIVEN case, shock, cerebral concussion and contusion are often associated so that treatment of these conditions must be considered together. As regards shock, most of the treatment recommended in previous years is still acceptable, i.e., the control of bleeding from accessible vessels, the recumbent posture, body elevated and head lowered, warmth, and certain non-alcoholic stimulants (as caffein or epinephrin).*

The intravenous injection of solutions of blood plasma marks a real advance. This measure not only counteracts shock, but is directly helpful in combating the cerebral injury. Having survived the period of shock, those patients should be lumbar punctured who are not making satisfactory recovery because of their cerebral condition. I have particular reference to patients in whom coma deepens or persists, or in whom focal cerebral signs appear. The pressure of the spinal fluid should be estimated by manometer and if it is raised, enough fluid should be removed to bring the pressure down to or even a little below normal limits (viz., 50 to 100 mm.). If the pressure is normal, measures of dehydration are not indicated.

The era of dehydration therapy passed when it became apparent that large scale and persisting cerebral edema is not as common as formerly thought. One does not see instances of toxic dehydration now as we did formerly when hypertonic solutions were given almost routinely. If intracranial pressure is much heightened, dehydration can be effectively produced by means of colonic injections of hypertonic magnesium sulphate solutions (33⅓%) and/or by repeated spinal taps. In this way one avoids the subsequent swelling of brain tissue due to the tissue retention of the hypertonic sugar (or other) molecules. If the spinal fluid is bloody, its removal from time to time is of value in order to lessen the irritation of the leptomeninges and to prevent formation of subarachnoid adhesions. For the delirium or restlessness, quick acting sedatives as chloral or paraldehyde by rectum are valuable,—barbiturates may also be used, but morphine or its derivatives seldom if ever. Skillful nursing and a continuous tub are much more to be desired than forceful restraint. In cases of prolonged unconsciousness we seem to be dealing with a profound disturbance in the metabolism of cerebral neurones. The first step in the treatment of these cases is to eliminate a focal lesion, such as a subdural or intracerebral hematoma, for which surgical intervention is required. The absence of cerebral focalizing signs and the presence of a normal or lowered intracranial pressure, as measured by lumbar tap, and the lack of optic disc swelling will be of aid, but in an occasional doubtful case, trephination and ventricular air studies may be necessary. Intravenous plasma, normal saline and/or intravenous glucose in low dilution (viz., 5%), and oxygen inhalations may be helpful. High caloric and vitamin intake must be maintained, if necessary by gavage or per rectum.

Gross Cerebral Contusion

SOME patients who have received a severe head injury develop signs of focal cerebral disease due to gross cerebral contusion. These signs are a mild mono- or hemiplegia with increase of the deep reflexes in the affected limbs and diminution or absence of the ipsilateral abdominal reflexes, and a Babinski toe sign. Other signs may be evident as aphasia, homonymous quadrant or hemi-anopsia, sensory defects, or focal or generalized convulsive seizures. When such clinical patterns are due to gross cerebral contusion, there is a tendency for progressive improvement in the focal signs; the coma or stupor lessens and if there is any increase of intracranial pressure (measured by lumbar puncture), this also diminishes.

Subdural Hematoma

IF THE above mentioned signs progress and are associated with deepening coma and evidences of increased intracranial pressure (again measured via lumbar puncture, and the degree of papilledema), the likelihood of an expanding hematoma is great. In the case of a subdural hematoma, the slow "growth" of the hematoma is accomplished by the absorption of cerebrospinal fluid brought about by the strong osmotic attraction of the blood clot's high protein content. Sometimes repeated venous bleeding also takes place and adds to the size of the clot.

On occasion one encounters remarkable fluctuations in the degree of consciousness,—now the patient is

*It should be said that most of the time we are concerned with so-called primary shock, which is due to vasodilatation. This is a transient phenomenon and responds well to vasoconstrictor drugs. As for secondary traumatic shock, called by Harkins "a progressive vasoconstrictive oligemic anoxia" (Surgery, 9:231-94, February; 446-82, March; 607-55, April, 1941) the replacement of the depleted blood volume by plasma is most necessary.

alert and cooperative, the next day stuporous and difficult to examine. The explanation for this phenomenon is not settled; it may be related to intermittent swelling of the clot or the occurrence of repeated venous hemorrhages causing enlargement of the clot. In cases of subdural hematoma, the hemiplegia is not infrequently on the side of the lesion, due to the fact that the opposite cerebral hemisphere is pushed over against the unyielding skull; this causes a hemiparesis or hemiplegia to become evident on the side of the blood clot.* The clinical picture may be quite variable, partly due to the fact that in about 30 to 40% of the cases hematomas are found overlying both cerebral hemispheres. Psychotic symptoms are not rare; occasionally signs referable to the 'tween and mid-brain are evident. Pupillary inequality and a variable degree of oculomotor paralysis are not rare.

Extradural Hematoma

THIS serious condition is most often due to rupture of the middle meningeal artery in fracture of the temporal bone. In typical cases there is the so-called lucid interval between the immediate symptoms following injury and the development, hours later, of a rapidly progressive stupor and hemiplegia, with signs of increased intracranial pressure.

Intracerebral (or Subcortical) Hematoma

IN A SMALL number of cases the rapid development of focal cerebral signs with evidences of increased intracranial pressure is due to an intracerebral hematoma. In these cases there is a fairly sudden onset of mono- or hemiplegia with or without convulsive seizures. Progressive impairment of consciousness is not so prominent a feature, as in subdural hematoma. This subject has recently been reviewed by Friedman[2] and Pilcher.[3]

In connection with the diagnosis of any of these types of intracranial hematomas, one important principle must be stressed. Given a case of head injury in which coma persists or deepens, associated especially with signs of increased intracranial pressure (revealed by the manometer attached to a lumbar needle or by papilledema) and with or without persistent or increasing focal cerebral signs, trephination is indicated on both sides, to determine the presence of extra- or subdural clots. Ventricular air studies may or may not be necessary.

In these hematomas, surgical intervention gives most satisfactory results; the removal of an extradural clot with clipping of the bleeding point, and the aspiration of a subdural or intracerebral hematoma are usually followed by most satisfactory results.

As for the treatment of the various infectious complications of skull and brain injury, the newer chemotherapy has materially brightened the prospects of recovery.

Spinal Cord Injuries

THESE are most often associated with fracture and/or dislocation of vertebrae. The commonest sites of vertebral fracture are the lumbar (about 52%), next the cervical (26%), then the thoracic (20%), least the sacral area (2%) (Wortis and Sharp[4]). The sixth cervical and the first lumbar vertebrae are the two bones most often fractured.

It should be emphasized that the cord can be severely concussed in the absence of bony injury of the vertebral column. The nerve cells of the spinal cord, like those of the brain, may be injured by concussion. Claude and Lhermitte[5, 6] studied the effects of concussive trauma on the spinal cord in cases observed during the first World War and pointed out that the pathology in the cord was one of necrosis of nerve cells, axis cylinders and myelin sheaths; the white was much more affected than the gray matter, and the lesions were independent of vascular damage. Furthermore, the same changes above described in connection with cerebral trauma may be observed in the tissues of the spinal cord. In the acute phase one also encounters hemorrhage which may be extra- or subdural, subarachnoid and subpial; most important, however, is intraspinal hemorrhage, i.e., hematomyelia. This intramedullary bleeding affects especially the more vascular gray matter of the cord. Within the spinal canal, hematomas of large extent (connected with the meninges) occur very rarely; this is in contrast to their frequent occurrence within the cranium. Acute injury to nerve roots and herniation of intervertebral discs are also observed. Later on, leptomeningeal adhesions, focal softening of the cord, and even cavitation may appear with secondary degeneration of anterior or posterior horn cells and of ascending and descending fiber tracts, and reactive gliosis. Herniation of the disc (nucleus pulposus) may come to be associated with hypertrophy of the ligamentum flavum,—and various changes may occur in the vertebrae themselves.

It is of prognostic importance for the physician to determine early whether the cord injury has produced a complete or an incomplete transection of the cord. The differentiation is made in the following table:

THE SIGNS IN TRANSVERSE LESIONS OF THE SPINAL CORD

	Incomplete Transection	Complete Transection
Paralysis	Asymmetrical	Symmetrical and Total
Voluntary movement	Returns	Does not return
Vasomotor and sphincter disturbances	Mild	Marked
Deep reflexes in the lower limbs	Present	Absent
Sensory defects	Partial	Total
Spinal automatisms: Uniphasic (*flexion*)		Present
Biphasic (flexion then extension)	Present	
Extensor reflexes	Present	
Babinski toe sign	Present early	Absent early; appears later
Irritative phenomena (pains, hyperesthesias, priapism)	Present at or below level of lesion	Absent

In complete transections of the spinal cord, a number of stages are described. These are not always clean-cut. The first is that of spinal shock: muscles innervated below the damaged cord segment are flaccid and completely paralyzed, so are bladder, rectum and penis. All reflexes in the involved limbs are lost. Sensation is missing in the skin and deeper tissues of the affected parts. The affected skin is cyanotic and cold and trophic ulceration quickly appears. This stage may last as long as three or four weeks. Then the second stage may ensue. Reflex activity reappears in the paralyzed limbs and incontinence of urine gives way to retention. The lower limbs may assume the position of flexion paraplegia. Phasic mass reflexes appear—such as automatic flexion of the lower limbs with contraction of the muscles of the abdominal wall, which causes the bladder to empty, and profuse sweating of the skin in the dermatomes innervated below the lesion. A coitus reflex (erection and ejaculation) may be very

*Another likely explanation of the ipsilateral hemiplegia is the pushing of the opposite cerebral peduncle against the sharp edge of the tentorium cerebelli.

easily elicited, and the knee and ankle jerks may reappear. The skin is no longer so dry, because of renewal of perspiration, and decubitus sores take on a healing tendency. In complete transections, however, the separated part of the cord is apt to become functionally devitalized because of the action of toxins. Then the reflexes remain lost or again disappear, the paralyzed muscles atrophy, bed sores spread and deepen and bladder and rectal sphincter function cease. Septicemia from urinary tract infection or from the consequences of trophic ulceration finally leads to a fatal issue.

Even though the prevention of spinal cord injury cannot be effected by the wearing of any special apparatus, some comment may be made on the immediate handling of a suspected case of cord injury. Laymen should be taught to suspect a broken back if the stricken individual, though conscious, is unable to move one or more limbs. In such a patient no part of the spinal column should be flexed. To insure extension the patient should be slid or slowly rolled over onto a wide board, plank, or even a door. If a broken cervical vertebra is suspected, especial care must be exercised. The patient should be kept on his back, and his head and neck should be held and steadied by an adult.

Mild traction of head should also be applied. If a blanket or stretcher is used, it is best to roll the patient onto the blanket face down, with the head turned to one side, providing there is no injury to the cervical spine. Four persons rather than two should then carry the individual. If a patient is unconscious from a head injury, this mode of handling is also advised, since a broken back may also be present. Assuming that shock has been properly treated and the patient has been removed to a hospital, the proper procedure is that outlined by Wortis and Sharp.[4] X-rays of the spine should be taken immediately, even while the patient is on the stretcher. Then the patient should be put to bed in such a posture as to correct any spinal deformity revealed by x-ray or other examination. However, if there is evidence of cord compression by fractured lamina, other bony fragments or foreign body (as a bullet or knife blade), operative intervention is necessary. Routine spinal puncture is not indicated in cases of cord injury. If a dislocation is present, as is liable to be the case in the cervical region, gentle attempts at reduction should be attempted by Taylor's method, or by gradual traction. Stookey's grooved air mattress which provides traction by way of the weight of the head may also be used (Stimson[8]).

There are other valuable aids in the treatment of spinal cord injuries: scrupulous care of the skin and the use of an air mattress and Munro's tidal drainage for bladder emptying, cradling of the feet and the prevention of foot drop by appropriate foot bolsters, colonic irrigation, aided at times by subcutaneous injections of prostigmine to overcome excessive flatulence. The use of chemotherapy in the form of sulfathiazole or sulfadiazine is often necessary to combat infection of the urinary tract or of the skin and deeper tissues involved in decubitus.

Later on, spinal tap should be performed in those cases of incomplete transection in which signs of disability increase or in which a standstill is reached. The presence of manometric block would favor neurosurgical intervention. The late indications for operative intervention are the encroachment of meningeal adhesions or callus on cord or roots, and herniation of an intervertebral disc with or without hypertrophy of the ligamentum flavum.

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Dividends

DR. VICTOR G. HEISER, in "Industrial Health in Wartime," *(Med. Rec.*, July, 1942):

"Industry and the medical profession have for many years sought to reduce the suffering and loss from illness and accidents among workers. Phenomenal progress has been made in the field of accident prevention by industrial physicians working in close cooperation with safety engineers, and, until thousands of green workers joined the ranks of the wartime industry army, the accident rate in industry was excellent in comparison with that in other public groups. Safety work is now being intensified among new workers. Under the direction of competent industrial physicians, hundreds of large companies throughout the country have instituted complete medical service programs within their plants. Results of these two correlative programs have been most encouraging, as indicated by a recent survey conducted by the National Association of Manufacturers in a number of plants having medical and safety programs. The companies with health programs surveyed reported a 63% reduction in occupational diseases, a 45% reduction in accidents, and a 30% reduction in absenteeism."

Industrial Man Hours

—How Caterpillar Conserves Them—

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INDUSTRIAL health has long been the modern manufacturer's deep concern. The staggering total of man hours annually lost through sickness and injury has been a distinct challenge.

Now every hour lost through ill health and accidents is a 60-minute reprieve for those who would push our freedom around.

One of the larger companies which, for years before Pearl Harbor, had concerned itself with industrial health by establishing well equipped first aid stations and programs for safety and health is the Caterpillar Tractor Co., Peoria, Illinois, where some 16,000 employees work day and night producing war materials.

Carrying on without fanfare, those in charge of man-hour conservation at "Caterpillar" have quietly increased the scope of their activities as employment has increased, and from a humble beginning the medical department has grown into one of the country's finest.

Pre-employment examinations consist of a complete physical examination including eye checking, blood tests and urinalysis. This examination determines the

Main first aid room, in immediate connection with Medical Department of Caterpillar Tractor Co. History of an injury is taken by nurse at left. Man in center receives first aid for injured finger. Man at right has continuous water bath applied to injured foot

Feature of Caterpillar's Medical Department is a complete laboratory—the only industrial laboratory approved by the State of Illinois Department of Health—and one of the few of its kind in the U. S. Fully equipped for all usual chemical and blood analyses required in industry

condition of the applicant and prevents his being placed on a job where he might be a hazard to his own and others' welfare. Rejections, amounting to less than 1%, are made only when the applicant is suffering from contagious diseases, marked high blood pressure, tuberculosis, serious heart diseases or a serious impairment of sight that would endanger himself and others.

Later, periodical and request examination are made at the request of the employee or his supervisor. Here the old adage, "An ounce of prevention is worth a pound of cure," is applied constantly.

By cooperating with the U. S. Public Health authorities' syphilis control program, Caterpillar has helped industry's fight against the "great killer." The company maintains its own laboratory, fully equipped for blood and urinalysis, blood cultures and chemical analysis to prevent and diagnose occupational diseases. A trained technician is in charge, and this is the only laboratory in industry approved by the Illinois Department of Health.

The physiotherapy department is fully equipped with infra-red, diathermy and ultra-violet; and injured employees are given massage by a trained physiotherapist.

A constant check is made by the safety and medical departments for chemical and dust hazards, so that the employee's health is continuously safeguarded.

Five first aid stations are conveniently located throughout the plant under constant supervision of graduate registered nurses.

Both health and accident problems are discussed in the employees' magazine in articles supplied by the medical department.

Medical records are considered confidential and are available only to the physicians in charge. Results of physical examination are not given to supervisors or other departments, thus giving the employee the same consideration he would normally receive from his personal physician.

Emergency treatment is rendered by the medical department in case of illness, but the individual is advised to consult his family physician. In many cases the latter is called and informed of the employee's condition so that the medical department's findings might aid treatment of the illness.

Accident prevention work is not the exclusive concern of the safety department. A well functioning safety program not only depends upon the complete operation of safety, medical and supervision generally,

Complete physiotherapy department with trained physiotherapist and modern equipment at Caterpillar

Modern x-ray equipment with shock proof features in Caterpillar Tractor Co.'s Medical Department

but also upon the employee himself; because no right thinking individual ignores a program designed to save him the loss of an eye, arm or leg, and to prevent his wife and children from suffering because of his carelessness.

Thus Caterpillar assumes a great part in the man-hour conservation phase of industry's remarkable battle for conservation . . . . a phase that takes its rank in importance with the salvage of tangibles.

It is quite apparent that men can't produce the implements of war without proper material; it is also time for everyone to face the fact that without industrial good health, and the resulting conservation of man-hours, our war production cannot operate at capacity.

Anoxic Considerations

—In the Diagnosis and Treatment of Craniocerebral Injuries—

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FAVORABLE progress in the treatment of craniocerebral injuries shows an upward shift of anoxic signs. The object of all therapy is to aid in such an upward shift.

SLIDING SCALE OF CEREBRAL ANOXIA

Normal cerebration	
Loss of judgment Loss of memory Loss of vision Stupor Restlessness and delirium Loss of movement	Upper level of functional cerebral change
Unconsciousness Muscle relaxation	Level of anesthesia
Tremors and convulsions Loss of cardiac rhythm Loss of respiratory rhythm Hyperthermia	Dangerous level of organic cerebral change
Death	

Five anoxic mechanisms, acting alone or in combinations, are important in the diagnosis, prognosis and treatment of head injuries.

I. *Anoxic Anoxia* (Oxygen pressure too low).

1. Obstructed airway (e.g., strangulation).

Rx: Pull tongue forward; support jaws; mechanical airway; turn patient on side; aspirate throat mucus.

2. Insufficient lung capacity (e.g., atelectasis, massive collapse, pneumonia).

Rx: Adequate oxygen mask or tent; elevation of head; bronchoscopy; sulfo drugs if indicated.

3. Depression of respiratory center (e.g., morphine, trauma).

Rx: Carbogen; artificial respiration.

4. Insufficient oxygen supply (e.g., high altitude, airplane transport; nitrous oxide anesthesia).

Rx: Adequate oxygen by mask.

5. Increased oxygen demand (e.g., hyperthyroidism, fever, heat).

Rx: Oxygen tent; keep cool.

II. *Anemic Anoxia* (Too few oxygen carriers).

1. Excessive blood loss.

Rx: Control bleeding; transfusion with whole blood (plasma if whole blood not available); oxygen by mask or tent; keep head flat.

2. Primary anemia.

Rx: Specific therapy; oxygen; transfusion.

3. Pleonexy from carbon monoxide.

Rx: Transfusion with whole blood; oxygen by mask or tent.

4. Pleonexy from chemotherapy (e.g., sulfanilamide).

Rx: Discontinue or reduce drug intake; oxygen by mask or tent.

III. *Stagnant Anoxia* (Circulation of oxygen too slow).

1. Shock.

Rx: Head low; keep warm; blood plasma.

2. Low blood pressure (e.g., spinal anesthesia).

Rx: Oxygen inhalation.

3. Arteriosclerosis, cerebral.

Rx: Oxygen by mask or tent; no sedation.

4. Localized space-displacing lesions.

(a) Extradural hemorrhage (lucid interval, few minutes or hours); rapid descent on anoxic scale; contralateral spasticity; homolateral enlargement of pupil; frequently fracture over site of middle meningeal artery.

Rx: Craniotomy with ligation of torn artery.

(b) Subdural hematoma (lucid interval, several hours to days); headache and skull tenderness, usually unilateral; vomiting; photophobia; slow descent on anoxic scale.

Rx: Trephine with rupture of subdural membranes and irrigation of subdural space; occasionally, later craniotomy to remove more extensive membranes.

(c) Subdural hydroma (same symptoms as subdural hematoma).

Rx: Trephine with small opening in dura; aspiration of fluid.

(d) Depressed skull fractures.

Rx: Elevation or removal of depressed fragments with local anesthesia; wound closed tight; sulfo drugs in compound wounds.

(e) Foreign bodies.

Rx: Remove if easily accessible and minimal brain damage will be caused by removal.

(f) Brain abscess.

Rx: Trephine; traction drainage, after allowing at least two weeks for walling off to take place.

4. Unlocalized increased intracranial pressure.

(a) Subarachnoid hemorrhage (immediate headache, vomiting, neck rigidity, often convulsions).

Rx: Spinal tap, allowing slow escape of one ounce of bloody fluid; repeat taps every day or two until headaches less or fluid straw-colored.

(b) Arachnoiditis, meningitis (slow development of intracranial pressure from failure of absorbing mechanism of cerebrospinal fluid).

Rx: Dehydration, 1,500-2,000 cc. daily fluid intake; occasionally right subtemporal decompression.

(c) Subcortical petechial hemorrhage (traumatic).

Rx: Elevate head; adequate oxygen, fluids and food.

(d) Diffuse anoxic degenerative lesions (perineural and perivascular edema and hemorrhage).

Rx: Elevate head; adequate oxygen, fluids and food.

IV. *Histotoxic Anoxia* (Oxygen not utilized by cerebral cells because of effect of extrinsic agents).

1. Inhalation anesthesia (ether, chloroform, cyclopropane).

Rx: Proper integration with other anoxic factors.

2. Intravenous anesthesia.

Rx: Proper integration with other anoxic factors.

3. Sedation (barbiturates, morphine, alcohols).

Rx: Proper integration with other anoxic factors.

4. Alcoholism.

Rx: Adequate oxygen; high caloric fluids.

V. *Neurohumeral Anoxia* (Oxygen not utilized by cerebral cells because relations and proportions of normal cell components are disturbed).

1. Concussion (disturbance of cellular function without permanent tissue damage).

Rx: Adequate oxygen, fluids, food.

2. Deficiencies of elements (electrolytes, vitamines) necessary for proper cellular metabolism (e.g., hypoglycemia, tetany, avitaminosis, etc.).

Rx: Proper replacements.

3. Disturbed relationship of elements necessary for cellular metabolism (e.g., diabetes, etc.).

Rx: Specific therapy.

4. Dehydration.

Rx: Proper water balance; usually 1,500-2,500 cc. fluids daily by mouth; increase with fever or in hot weather.

5. Frigeration.

Rx: Gradually increase temperature of environment to normal; adequate oxygen, fluids and food.

Read before the Chicago Society of Anesthetists, February 25, 1942.

General Considerations

THE RESTLESS PATIENT:

1. Observe frequently. Restlessness precedes coma in the descending anoxic scale and is a sign that the brain cells are calling for oxygen—not drugs.

2. Put pajamas on patient; lash two beds together or place mattress on floor so that patient can turn about at will.

3. Offer urinal and bed pan to patient at frequent intervals.

4. Do not talk to or touch patient if possible.

5. If too disturbed, use side boards or hand and foot ties—never resort to restraint with sedative or narcotic drugs for restlessness.

6. If morphine is necessary or desirable to control pain elsewhere in body, evaluate anoxic status before each drug administration.

WHAT TO WATCH FOR:

1. Frequent observations as to patient's status in the anoxic scale.

2. Pulse and respirations are usually rapid with brain stem injuries, slow with increasing intracranial pressure.

3. Frequent blood pressure readings disturb patient; other clinical signs are much more sensitive of improvement or deterioration in patient's condition.

4. Pupils which are pin point often associated with brain stem disintegration. Unequal pupils are often valuable signs of space-displacing lesion, the enlarged pupil usually being on the side of the lesion.

5. No attempt should be made to examine or clean a nose or ear which is draining blood or cerebrospinal fluid.

6. Deep and superficial reflexes, pupillary and fundoscopic findings should be recorded. Changes in these signs are of extreme diagnostic value.

X-RAYS:

X-ray studies of the skull should be made when the patient is cooperative. Such studies in the disturbed patient are usually of little diagnostic value and the necessary moving about does the patient no good.

PROGNOSIS:

Early prognosis is always hazardous in craniocerebral injuries. The prognosis is better if there is no respiratory difficulty present. Signs of meningitis usually do not appear until end of first week.

"No head injury so trivial that it can be ignored, nor so desperate that it should be despaired of."

The surgeon who is guardian of the unconscious patient with a head injury must see to it that the cerebral cells have access to adequate oxygen, water and food in that order.

FOOD:

Feedings through a nasal tube are generally more life-saving than intravenous feedings of glucose or saline. The stomach knows better than the surgeon what amounts and kinds of fluids and food are necessary to the cerebral cell and can extract these elements from a well balanced fluid diet. Also a tube pulled out of the stomach by a disturbed patient does less harm than a needle pulled out of a vein.

If transfusions are anticipated, an intravenous needle should be placed in the elbow or ankle vein preoperatively and the needle kept patent with normal saline or 5% glucose until blood or plasma is used.

Hypertonic fluids and dehydration therapy are almost never indicated. The effect of hypertonic solutions on the cell is transient and the destructive effect of dehydration on the cerebral cell may be permanent.

Physiological circulation should be established as rapidly as possible so that the edematous perivascular and perineural spaces resulting from cerebral anoxia may be restored to normal.

THERAPEUTIC EPITAPHS IN THE TREATMENT OF CRANIOCEREBRAL INJURIES:

Too much — Too soon — Too little — Too late!

Small Plant Program

IN LINE with the emphasis on small plant health, the industrial relations programs, and the present urge toward conservation of man power in industry, the features of such activities in the G. D. Searle & Co. organization, manufacturers of scientific pharmaceuticals, are of particular and timely interest.

This company at its new streamlined plant at Skokie, on the northwest limits of Chicago, employs about 170 people. The applicant for employment is asked to fill out a very comprehensive form, including items such as previous positions held and type of work; familial relationships; education; subjects in which the applicant excelled in high school and college; extra-curricular activities; previous experience; physical qualifications, and social affiliations.

A thorough pre-employment examination is then given, including Wassermann blood test, urinalysis, electrocardiogram, and fluoroscopy. A review examination is also given each employee every year. These examinations are conducted by the regular medical staff, and any defects are followed up as to corrections, under a system which checks the results. A combination examinations room and dispensary provides for the initial and periodic examinations, and affords dispensary service for first aid in cases of injury and minor illness.

Every one in the organization is required to carry a minimum of $1000 group life insurance, on which the company pays half the premium. About 90% of the employed group subscribe to the hospital care plan, toward which the company pays the first $.40 of the monthly cost of membership.

The company's pension system is unique in certain of its provisions:

1. The plan is non-contributory so far as the employee is concerned. The management felt that the company should contribute all of the funds, because in the event of the possibility of not being able to carry the plan through on the basis of its intended permanency, the employees would lose only the pension and not any savings of their own which had been contributed by them. Pension plans too often have failed to keep employee funds intact under contributory arrangements.

2. Employees in the lower earning brackets should have a higher percentage of income reflected in the pension amount than those in the higher earning brackets. Few if any of the usual pension plans have adequate provisions in this respect. Such, however, are a feature of the Searle plan.

3. The managers and directors of this plan have sufficient discretionary powers to allow pensions to individuals who, for reasons of illness or other circumstances, may prove unable fully to comply with all of the provisions of eligibility. In the ordinary types of plans this is unusual because it is so often impossible.

4. An ideal pension set-up should include a provision for the widow of the employee. For example, a man retires at 65 and dies at 66; payments stop, and the widow is without benefit or compensation for the years she and her husband worked together. The present plan is aimed at this ideal eventuality of continuance of the pension to the widow.

The employees are encouraged to use the recreational facilities which are provided by the company—during the luncheon period, and also through specially arranged events in the evenings. The latter take the form of stage presentations, musical numbers, dances, card parties and the like, held in the spacious ballroom adjacent to the lounge.

The company recognizes that these provisions, in addition to the excellent arrangements for safety and hygiene, are intended to maintain a high standard of fitness and efficiency, by keeping the employees mentally and physically comfortable while at work.

Skin Sensitivity

—As a Factor in Job Placement—

JAMES H. BIRAM, M.D., F.A.C.S.,
Medical Director, Colt's Patent Fire Arms Manufacturing Co., Hartford, Connecticut

NEARLY a year ago, and shortly after a large increase in the number of people we employed, we awoke to the fact that skin rashes on the hands and arms caused two-thirds of our total lost time, and, as a rule, more disability than all our accidents.

We also found that it was impossible to hire experienced help, i.e., men who were accustomed to work in oil and cutting solutions. We were forced to take and train as machine workers clerks and farm boys. They were the ones who were giving us much the larger proportion of these cases.

We tried out various protective creams and soaps, with some success. We also gave instruction in the care of the hands and arms, which seemed to help a little more, but we still had the problem.

To obtain a clearer view of the picture we grouped our cases in five main groups. We admit this is not perfect, or even scientific, but it covers our needs.

In Group 1 we placed the so-called oil boils and oil folliculitis which we consider to be related to acne and due, in great part, to lack of care of the skin.

In Group 2 we placed the primary irritant types of dermatitis, such as the alkaline rashes and those resulting from contact with materials and solutions about the plant. Also soaps, contacts about the home, etc.

In Group 3 were gathered the true sensitivities which have positive patch tests to oil, exanol solution, cyanide dust, and other shop contacts. These cases are comparatively rare.

Group 4 contained the common non-occupational skin diseases, such as psoriasis, seborrheic dermatitis, erythema multiforme, pityriasis rosae, tinea versicolor, etc.

In Group 5 were a large number of cases very resistant to treatment and called variously by the skin specialists—as oil poisoning, eczematoid dermatitis, occupational dermatitis, and dermatophytid. These cases undoubtedly belong under Group 4, but as they constituted our largest and most troublesome problems, we gave them a special place.

We found we could control Group 1 quite easily with instruction as to the care of the skin and treatment, and that we could keep them nearly always at work on their jobs.

The cases in Group 2 were numerous, especially among new employees, before they became "salted." We tried treatment, protection and advice with considerable success, and rarely took them from their jobs.

These merge very closely into Group 3, which are patch test positive and must be removed from the causative agent in their work.

DR. BIRAM'S original and excellent suggestion of a community "pooling arrangement" for the transfer of workers among suitable employments has the following background (*Hartford Courant*, June 26, 1942):

"Inaugurated less than a month ago, the plan to save man-hours which otherwise would be lost from the production line by persons incapacitated through skin troubles is said to be the only effort along such lines in the United States. Working in cooperation on the problem are the Connecticut State Medical Society, the vocational rehabilitation division of the State Department of Education, the United States Employment Service, the Manufacturers' Association of Connecticut, and various individual plants and industrial physicians.

"The importance of the plan, involving closer checking of applicants for employment, transfers of workers from one department to another, or even, possibly, from one company to another, retraining and rehabilitation, is likely to grow rapidly, according to interested doctors and industrialists. This is because manufacturers are being driven to the use of more toxic chemicals as supplies of those they have been using are exhausted, and as industry is changed over to total war effort and production forces expanded.

"Without some such arrangement as is now being worked out, blondes may find they are on the non-preferred lists for employment, for there is some experience that persons with light hair are more likely to have sensitive skins than those with dark hair. Another result may be to save persons having athlete's foot from being classified as industrial cripples, for they can prove to be bad risks under workmen's compensation law.

"Attention was focused on the problem by DR. JAMES H. BIRAM, Medical Director of Colt's Patent Fire Arms Manufacturing Company, at the sesquicentennial meeting of the State Medical Society early this month. In discussion of a statement by J. J. BLOOMFIELD, Chief, State's Relations Section, Division of Industrial Hygiene of the U. S. Public Health Service, that industrial employment physical standards are too high, DR. BIRAM cited the problem of the sensitive-skinned persons and suggested that some sort of employment pool might be arranged for the transfer of workers to jobs where they would not be exposed to the particular elements causing reactions. The matter was referred to the industrial health committee of the State Medical Society. . . .

"DR. BIRAM'S chief problem at Colt's has been oil, though he maintains the problem is one of reaction of the individual, rather than the purity of the oil. 'Our oil is purer, measured by bacteria count, than the city drinking water,' he said, asserting

Those in Group 4 were disposed of by sending them to a skin specialist for diagnosis and treatment.

The cases in Group 5 were, and still are, our greatest problem.

We came to the opinion that this condition is a sensitization, either to some product of the growth of various fungi causing "athlete's foot," the absorption of products of the decomposing skin, or, perhaps, the absorption of the products of secondary infection. Nearly all of these cases had, or had had, an active foot infection. There is no question that they are aggravated by the oil and so-called soda solutions. Under the aggravation clause in the Connecticut Compensation Act they become a compensation liability. They must be taken from their jobs and cannot work in oil or exanol solution again without a relapse, even though they are negative to patch tests. We have had three cases among filers, which is a dry job, who have returned to work without recurrence. We also have seen a number of cases among our female help who are on dry jobs, but who wash dishes and clothes at home.

On dry jobs the work does not seem to be an aggravation factor.

These cases are very resistant to treatment and have a long period of disability before they can be put even on dry jobs. Very great care must be exercised in treatment, so that medications used do not aggravate the condition and ultimately result in a poly-sensitivity.

WITH these groups in mind, we tried to see if in our pre-employment examinations we could find at least some of the answers to our problem. We designated the severity of these conditions as 1-plus up to 4-plus.

In the first group those with acne above 1-plus, unless well burned out, were rejected. As we can take care of this condition quite satisfactorily, we are now passing for employment the 2-plus individuals.

We try not to employ blondes, red blondes, and the thin-skinned, where they come in contact with irritants. This has shown satisfactory results in Group 2.

For Group 3 we attempt nothing at the present time, as it would not pay to patch test all applicants for the small number involved.

We do not employ any in Group 4 until the condition has been cleared up. If it is not curable, no job as long as the aggravation clause in our compensation law exists.

In Group 5 we employ no one with the phytid reaction on the hands or in the groin. We also do not employ even the 2-plus cases of athlete's foot. They must have this condition cleared up before they can have their job, and we would rather they did not return.

By these precautions we have reduced our percentage of skin conditions, in comparison with numbers employed, by about 30%. Perhaps some of this drop is due to the larger number of women employed, who, contrary to our expectations, seem to have less skin affections than the men, although on the same type of job. We find they take much better care of their skins, and come in much earlier for treatment.

As our examiners become more proficient we expect to reduce this percentage. I have been sending them out into all departments of the plant for an hour a day alternately, so that they may become familiar with all machines, processes, oils, and solutions; and I have them come to the main first aid the same way, so they may see what happens as a result of their acquiescence in the placements made by the employment department. We expect by these measures further to reduce the incidence of skin conditions among our employees. We have gained some on this problem, but we have a long way to go.

In industries such as ours it is difficult to find dry jobs. This forces the company to pay compensation until such jobs can be found. This is unfair to the employee, for he waits for re-employment for fairly long periods. The time will come when there will be no more dry jobs available.

It was with this in mind that I proposed before the Industrial Section of the State Medical Society at its last meeting that if the government formed the expected labor pool we be allowed to trade employees who could not work under our conditions for others who could not work in another type of plant. Committees of the government, state agencies, and the Connecticut State Medical Society are working on this problem. It is to be hoped they find the solution in the very near future. It will not only mean much to the companies and the men involved, but also will make for more available man power.

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that many other companies which are not as careful as Colt's of the purity of the oil used, have a much worse problem.

"Athlete's foot becomes a part of the picture because sensitive-skinned persons develop a weeping rash of the hands which is aggravated by exposure to oil, soda solutions, and other moist agents. This is not exclusively an industrial health problem, DR. BIRAM said, explaining that about the same proportion of cases come to doctors from sensitive-skinned women who develop these conditions through exposure of their hands to strong soaps in washing dishes or clothes. Industrial workers whose condition is aggravated by exposure of their hands to moist agents can collect workmen's compensation under the aggravated disease provisions of the law.

"The seriousness of the problem also was stressed by Compensation Commissioner LEO J. NOONAN, who explained that the commissioners can't take waivers on persons with skin diseases, and plants won't hire such persons without waivers. In the present employment boom, he said, it is relatively easy to place such workers in jobs where they are not exposed to agents which affect them. When employment contracts, it will be difficult for sensitive-skinned persons to find jobs, and those already employed may have to be carried as compensation cases for total disability. 'Retraining is the only answer,' in his opinion.

"Thus far the classification of workers has been in the broad division of wet and dry jobs. A machinist, for example, who reacts to oil or some other liquid used regularly on a particular job, is shifted to a 'dry' job, where he can utilize his skill in an operation not requiring the use of any liquids at all and replaced on the 'wet' job by some one who is not skin-sensitive.

"In any given factory, of course, the opportunity for such transfers is limited, and it was with the idea of making available a large number of jobs in which men could be swapped that DR. BIRAM suggested a pooling arrangement. Consent of the worker would be necessary in any such exchange of jobs, and, while that has not yet been tried, cooperation by those who have had to be shifted away from jobs they were doing because of their reactions has been good. . . .

"A hint of the possible 'shape of things to come when industry, after the war, has a chance to apply to peace production the knowledge acquired now came from one interested in rehabilitation work who cited studies being made in California of grouping, in industrial departments, workers of similar temperaments, on the same theory that has brought about organization of the crews of bombing planes as teams whose members are naturally adjusted for split-second cooperation."

Emergency Measure

—Annual Meeting Omitted—

THE AMERICAN ASSOCIATION OF RAILWAY SURGEONS has an unbroken record of annual meetings since 1890; a succession of 52 programs of progressive excellence.

It is with regret, therefore, that the Executive Board—mindful of the vast and increasing impact of war conditions on both railway equipment and railway men—has decided that the Fifty-Third Annual meeting scheduled for September of this year will be omitted. So many local surgeons have gone into the armed forces, particularly within the last few months, and the increase not only in the numbers of railway employees but also in the intensity of their work is so great, that the burden of responsibility on those who have to carry on at home is huge and still growing. Keeping freight wheels rolling is as vital to the war effort as keeping factory wheels turning; and the use of transportation facilities for anything other than absolute necessities must be deferred. And so to urge the Association members to remain in close personal every-day contact, each with his vital part of the national effort, is considered by the officers of the Association an emergency measure—more in keeping with the all-out requirements of the times than to call them away even for the short period of a convention session. Thus there will be no annual meeting this year.

Dermatitis

—From Creosote-Treated Wooden Floors—

LOUIS SCHWARTZ, Medical Director,
United States Public Health Service

THE occurrence of dermatitis resulting from contact with coal tar creosote has often been reported, and creosote oil used for the preservation of wood has caused dermatitis among workers engaged in wood preserving as well as among men engaged in handling the creosoted wood.

In many of the new factories erected for the manufacture of war materials floors of creosote-treated wooden blocks are being installed. Recent studies of skin hazards in two new buildings having such floors have confirmed the expectation that allergic dermatitis and photosensitization would occur among some of the workers employed in these buildings.

Three affected workers were seen in plants manufacturing armaments—two in the same plant. The symptoms were identical in all three cases,—a week or two after beginning work, the employee noticed that the ankles began to itch above the shoe tops and later an erythematous, papular, and vesicular eruption appeared. The lesion extended four or five inches above the shoe tops and, when seen, presented the appearance of a scratched eczematoid dermatitis.

The workers stated that the condition improved over the week-end, and they themselves attributed the dermatitis to the creosote which evaporated off the wooden floors. It is more likely, however, that the fresh creosote on the blocks came in contact with ends of the trousers and rubbed against the ankles.

Patch tests were not performed with scrapings from the wooden blocks, as previous experience in patch testing with creosoted wood has shown that it is a primary skin irritant as well as a sensitizer. None of the workers complained of photosensitization. This may be because the creosote which evaporated from the blocks did not reach the face in sufficient concentration to photosensitize.

Before the etiology of the condition was discovered, one of these patients had been treated with a coal tar ointment and the dermatitis had become much worse.

The patients were advised to stay away from work for a few days until the lesions cleared up, and, on returning to work, to apply each day a protective ointment to the feet and ankles about half way up the leg. The ointment recommended consisted of 70 parts of anhydrous lanolin and 30 parts of castor oil.

In other factories where the floors were made of creosoted wooden blocks which had been in use for several months, the odor of creosote was no longer perceptible. In these factories it was learned that there had been some cases when the floors were newly laid, but that, as the floors became older and the excess creosote evaporated or wore off, there was no further occurrence of the condition.

From the Section of Dermatoses Investigations of the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service.

Diagnosis of Undetected Diabetes

—Report of a Study of a Group of 1,800 Individuals—

EDWIN W. GATES, M.D., F.A.C.P.,
Medical Section, E. I. du Pont de Nemours & Company,
Niagara Falls, New York

FOR years many authorities have estimated with varying results the number of cases of diabetes in the United States. Apparently in the study up to the present, efforts have been directed only toward finding the number of known cases in any given number of people.[1] In 1936 the National Health Survey[2] reported that there were probably 660,000 cases of diabetes in the United States. Joslin[3] estimated that there are over 600,000 diabetics in this country. Recently he noted[4] that in the United States one person in every 200 is said to have diabetes, making a total of 700,000 cases of diabetes. The Metropolitan Life Insurance Company[5] estimated that there are between 500,000 and 600,000 diabetics in this country today, and that by the end of this decade the number will reach 1,000,000. Meakins[6] stated that the incidence of diabetes in the United States is 0.3% of the population.

The possibility of ascertaining as nearly as possible the actual number of cases of diabetes in a given group has appealed to us for some time. It has seemed very desirous to us not only to know more accurately the true incidence of diabetes in a certain group but also to find those who had not known they had the disease so that we could place them under proper treatment and thus prolong their lives and their usefulness.

The early discovery of diabetes is so important that we have felt if we could by any practical method identify those who had the disease, or who might develop it, we would be able to prolong the lives of the former and possibly postpone or prevent the development of the disease in the latter. Joslin[7] advised: "Prevent diabetes, but if attacked, discover it early and halt its progress." Also,[8] "Early recognition and instant beginning of treatment may lessen the severity of diabetes for a patient's whole life time." Again, if one will read Joslin's Diabetic Creed[9] the importance of early discovery of the disease is stressed most emphatically. Smillie[10] said: "The prognosis is best in the incipient cases in which the condition is discovered early and the carefully-treated patient will live the longest. A continuous search should be made in the community for diabetes."

It is evident that the early discovery of those who have the disease or who are "border-line" will lengthen

the lives of those who have diabetes and may prevent development of it in those who are potential. We have felt that a little prevention was worth a great deal of treatment, and a little early treatment was far more beneficial than extensive later treatment.

What a wonderful work in preventive medicine it would be if we could identify all the persons having diabetes and potential cases of diabetes in the United States!

In 1920 diabetes was discovered in less than 0.66% of all new patients admitted to the Mayo Clinic. This percentage increased in 1936 to nearly 2%.[11] Bolduan[12] said that there is reason to believe that the total number of diabetics in New York City is not far from 1%, and it is probably conservative to estimate the cases of diabetes in the United States as over 600,000. However, the large Jewish population of New York City increases the relative incidence of diabetes in that city because of the greater prevalence of the disease among the people of that race.

We believed a more reliable procedure would be to study some large group of the population in an attempt to locate the number of cases of diabetes and those which might be potential cases. In considering the most likely method to carry out such a plan we decided to study the employees of a moderately large industry. As we knew the exact number of known diabetics in this plant, the incidence of diabetes in this group appeared to be larger than might be expected based on the relative, known occurrence in the United States. It was impossible to investigate each individual. We, therefore, decided to study those in the groups which would be most likely to have this disease.

Three groups were chosen from the total of 1,800 individuals; those with a familial history, those with a hereditary history, and those who had shown sugar in their urine. We believed that these three groups would contain the majority of the persons who had diabetes, or who might develop it. The probability of missing a few was still to be considered, of course, but this plan appeared most likely to give the best results.

All employees in this plant have been given a thorough physical examination annually, including urinalysis, x-ray of chest, and blood Wassermann. The urine specimens have been obtained approximately one and a half hours after breakfast.

We have kept careful record of the histories of diabetes in the employees' immediate families or in any of the ancestors on either side. In this group of 1,800 persons we have found eight with a familial history of diabetes, 63 with a hereditary history and 46 whose urine had shown sugar on one or more occasions. The total was 112. It was in this group of 112 that we felt we would find most of the cases of diabetes in the entire group of 1,800.

The following table from Joslin[13] based upon the National Health Survey shows the distribution of diabetes by age and sex:

RATIO OF DIABETES IN THE POPULATION

Age	Males	Females	Figures at left based on diabetics per 1000 Population from National Health Survey as follows: Age	Persons	Males	Females
0—14	1:2500	1:2500	0—14	0.38	0.35	0.41
15—24	1:1700	1:1700	15—24	0.59	0.62	0.57
25—34	1:1100	1: 900	25—34	1.00	0.90	1.08
35—44	1: 500	1: 300	35—44	2.61	2.01	3.16
45—54	1: 225	1: 125	45—54	6.56	4.49	8.64
55—64	1: 100	1: 50	55—64	14.25	9.96	18.20
65 and over	1: 70	1: 45	65 and over	18.39	14.58	21.47
			All ages	3.67	2.73	4.53

The above data are based upon 9182 diabetics in a surveyed (urban) population of 2,502,391 persons.

This table clearly illustrates the increasing incidence of diabetes with advancing age. It also gives the number of known diabetics per 1,000 population and the ratio of the males and females.

We have found relatively the same increases with the increasing ages in most of the age groups, although our occurrences per thousand are much higher because we have included not only those known cases of diabetes before the investigation was started but those discovered as a result of the tests.

Joslin[14] classified as true diabetics those whose venous blood sugars on an unrestricted diet are 0.13% or more fasting or 0.17% or more after a meal with simultaneous glycosuria, which is plainly related to diet; he classified potential cases of diabetes as those with glycosuria closely related to diet but where blood sugar is below 0.13% fasting and not reaching 0.17% after a meal; in the unclassified glycosurias he placed so-called alimentary glycosuria, cases with a low renal threshold and chance glycosuria due to a great variety of causes.

Meakins[15] stated that a fasting venous blood sugar above 140 mgs. is certain evidence of diabetes.

Bowen[16] said: "All observers agree that a definite fasting hyperglycosuria in the absence of such conditions as hyperthyroidism, etc., indicates diabetes mellitus."

Again he stated: "If a fasting blood sugar exceeds 130 mgs. in patients without hyperthyroidism, uremia, or infection, it may be assumed that the glycosuria is one of diabetes mellitus."

Joslin's blood sugars were done by the method of Folin.[17] The method which we used for determining blood sugar was the Myers-Bailey modification of the Lewis-Benedict. With the exception of four cases, the following criteria were used to establish a diagnosis of diabetes using the glucose tolerance test:

The starvation blood sugar should be 0.14% or more and the post-prandial should be 0.22%. The blood sugar should not fall so low as the starvation sugar at the end of two hours, and there must be accompanying glycosuria.

We have classified potential cases of diabetes as follows: Those whose starvation blood sugars were under 140 mgs., whose peak did not rise to 220 mgs., whose two-hour blood sugar did not fall to 140 mgs., but may have nearly approached it, and who have accompanying glycosuria. The higher limits of blood sugar have been used because the blood sugars usually run higher with this method of determination.

However, there were five classified as potential cases of diabetes, whose blood sugars did not fall exactly within the above limitations but for various reasons it was believed that they should be classified as potentials.

Unclassified glycosurias were those of a miscellaneous group including those with apparently a low renal threshold and alimentary glycosuria.

We have done glucose tolerance tests on 109 individuals. Seventy of these individuals had given a history of having some relative who had diabetes, 43 had shown sugar in the urine, and four had shown sugar in the urine and also had given a positive history.

Realizing that the glucose tolerance test may be inaccurate if the individual has been restricting his diet, no tests were done on persons who had been restricting their diet in any way. The glucose tolerance test, which we used, was as follows:

Each individual reported in the morning without breakfast and having had no food for approximately 16 hours. A sample of venous blood was obtained and a specimen of urine; 100 gm. of glucose in solution was given orally and samples of blood and urine were tested

at one-half hour, one-hour, two-hour, and three-hour intervals.

From these glucose tolerance tests it has been determined that 70 are normal, 19 are potential, 17 have diabetes, and three are unclassified, questionable, or alimentary glycosuria.

Six of the glucose tolerance tests were done some months earlier. Two were classified as normal, two as questionable, and two indicated diabetes. The last two individuals were included in the eight known diabetics before this investigation was started.

There were three persons, known cases of diabetes, on whom no glucose tolerance test was done. This would give a total of 20 diabetics in the total group of 1,800 employees.

The following table indicates the occurrence of diabetes in the age groups per 1,000 persons in the group of 1,800 persons and the personnel of the plant in question is classified according to age groups:

Age	No. of Persons	Diabetics Per Thousand
15—24	245	4
25—34	604	6.66
35—44	540	12.0
45—54	316	18.0
55—64	89	11.0
65 and over	7	120.0

The group examined by us is too small to permit accuracy in percentages.

The incidence of diabetes increases with the increase in age and at a rate comparable to increases noted in Joslin's table.[18]

The classification according to age groups of the results of the glucose tolerance tests is shown in the following table:

RESULTS OF GLUCOSE TOLERANCE TESTS ACCORDING TO AGE GROUPS

Age	Normal	Potential	Diabetics	Unclassified, Questionable, Alimentary Glycosuria	Total
15—24	11	..	1	..	12
25—34	24	4	2	1	31
35—44	24	8	6	1	39
45—54	9	6	5	..	20
55—64	2	1	1	..	4
65 and over	..	..	2	1	3
	70	19	17	3	109

The following table classifies the results of the glucose tolerance tests according to our findings and according to familial and hereditary history and the presence of sugar in the urine on routine tests:

KNOWN DIABETICS

Glucose Tolerance Test Omitted

History of Diabetes: Hereditary		History of Diabetes: Familial		No History of Diabetes		
Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	
1	..	..	..	2	..	Total—3
			(1)		(2)	

Sixty-two of this group had an hereditary history of diabetes. Only eight, or 13%, were found to have diabetes.

This may appear to be a low figure and the results of further investigations will be interesting. Eight of those given glucose tolerance tests had a familial history of the disease and none of them was found to have diabetes. Eight of the hereditary group were classified as potential diabetics and probably some of these will develop the disease later, thus increasing the percentage of the diabetic group. Thirty-nine of those tested gave no hereditary history or familial history but sugar had been found in the urine. Nine of this group were found to be diabetic and 10 were classified as potential, while 17 were found not to have the disease.

No diagnosis was made on one who is still under observation, who is as yet unclassified; two were believed to have alimentary glycosuria.

It will be noted that eight (47% of our diabetics) had hereditary histories of diabetes. None of this group had a familial history. This is a high percentage compared with the figure of 19.1% shown by Joslin.[19]

Four in the group tested had a hereditary history and also had sugar in the urine.

Two were classified as having diabetes and two as potential.

Two of those examined gave both familial and hereditary history and both had a normal glucose tolerance test.

We would expect to find among 1,800 employees (representing a good average cross-section of the country) nine diabetics, but as previously stated, it is seen that in this group of 1,800 we have 20, plus 19 potentials.

It is our opinion that in following these potential cases during the coming years a number will develop active diabetes.

Joslin[20] stated that heredity determines the susceptible individuals but of the precipitating factors obesity is by far the most important. Approximately 12.97% of the entire personnel of this plant are overweight, while 50% of our cases of diabetes are obese, and 52.6% of our potential cases are obese. It has been

RESULTS OF GLUCOSE TOLERANCE TESTS

NORMAL

History of Diabetes: Hereditary		History of Diabetes: Familial		No History of Diabetes	
Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine
..	46	..	7	17	..
					(70)

POTENTIAL

History of Diabetes: Hereditary		History of Diabetes: Familial		No History of Diabetes	
Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine
2	6	..	1	10	..
					(19)

DIABETICS

History of Diabetes: Hereditary		History of Diabetes: Familial		No History of Diabetes	
Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine
2	6	..	..	9	..
					(17)

UNCLASSIFIED, QUESTIONABLE OR ALIMENTARY GLYCOSURIA

History of Diabetes: Hereditary		History of Diabetes: Familial		No Hiistory of Dabetes		
Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	Sugar in Urine	No Sugar in Urine	
..	..	..	..	3	..	Total—109
					(3)	

shown that diabetes is 13 times more common among the obese than among the underweight.[21] We consider the large percentage of obese cases of diabetes to be very significant.

The personnel of this plant consists of a cross-section of the population of this country representing at least 25 states including 20 nationalities.

The average living conditions of the employees in question are considered to be excellent as the pay rate is quite high.

As all these 1,800 employees had been given a careful, physical examination at least once per year, we have an accurate follow-up on their physical conditions for several years and in a large percentage for 10 years. Before glucose tolerance tests were done on any of the cases we attempted to determine whether or not there was any factor in the individuals' physical conditions which might affect the results of the tests.

All persons examined were classified as follows:

"A" physical condition—no physical defects of any significance.

"B" physical condition—average, with no serious defects.

"C" physical condition—the presence of physical defects which more or less have pathological significance.

A review of the physical conditions of the individuals who were examined shows that 36 (33.03% of the total group) were in excellent physical condition, 51 (46.79%) were in average physical condition, and 22 (20.18%) in what we term poor physical condition.

The normals, potentials, diabetics, and unclassified groups are tabulated in the following table according to physical condition and comparative percentages with the entire plant are given:

PHYSICAL RATINGS OF THE PERSONS WHO HAD A GLUCOSE TOLERANCE TEST

Group	"A" Physical Condition	% Group	"B" Physical Condition	% Group	"C" Physical Condition	% Group	Total	% Group
Normal.....	29	41.42%	30	42.85%	11	15.71%	70	100.0%
Potential.....	4	21.05%	12	63.15%	3	15.78%	19	100.0%
Diabetic.....	3	15.0%	8	47.06%	6	35.29%	17	100.0%
Questionable, Unclassified, or Alimentary Glycosuria....	..	—	1	33.3%	2	66.6%	3	100.0%
Group Examined	36	33.03%	51	46.79%	22	20.18%	109	100.0%
Entire Plant....	..	44.8%	..	39.5%	..	15.6%	..	..

The relative percentage of the normals in "A" physical condition is approximately the same as the percentage of those in the plant in "A" physical condition. The percentage of those having diabetes in "C" physical condition was found to be about 2½ times greater than the percentage of those in "C" physical condition in the entire plant. The relative percentage of those in "C" physical condition among the diabetics should decrease, however, as these individuals are brought under control by their family physicians.

The following defects and the number of occurrences were found among the "C" physical group of those classified as having diabetes:

No. of Occurrences	Defect
2	Chronic fibrous pleurisy
5	Obesity
1	Arrested tuberculosis
1	Defective hearing
3	Hernia
1	Hypertrophic osteoarthritis
1	Hypertension

It was felt that none of these had any relation to the diabetes with the possible exception of the obesity.

One individual in every 90 in this group studied has diabetes. This compares with the estimated occurrence of 1-200 in the country as a whole.

We feel that the incidence of diabetes in this city (85,000 population) where this work was done, should be approximately the same as it is in our group of 1,800 men and women, who represent only a small percentage of the total population of the city.

We have followed up those who were diagnosed as diabetics. In most every case we have information, either obtained from the family physician or by studying the cases ourselves, to confirm the original diagnosis. All the obese potential diabetics are reducing and losses in weight up to 40 pounds have resulted. The others on the potential list are restricting their diets moderately.

We found a great deal of interest expressed among the individuals contacted while we were carrying on this work. Many of those who had a familial history of diabetes or near relatives with diabetes apparently had been wondering whether or not they would develop the disease. Some had been assured by their physicians that they did not need to worry about it; others were extremely interested in having this glucose tolerance test done for them.

A number have undertaken to check their relatives and attempt to ascertain whether or not diabetes is present in their families, particularly in their children. White[22] says that "in 72 living cases (children) with diabetes of 10 years' duration heredity has reached 53%." If it is important to discover diabetes early in adult life, it is even more important to discover it early in childhood. Possibly we can expect some early discoveries in some of our families.

Summary

IN AN industrial plant, among 1,800 individuals, who for years have had careful, annual, physical examinations including at least one urinalysis each year, eight gave a familial history of diabetes, 63 had an hereditary history, 46 showed sugar in the urine, and eight were known to have diabetes.

2. Glucose tolerance tests were done on all those with a familial or hereditary history of diabetes and also on those who showed sugar in the urine.

3. Nine of those who gave a hereditary history of diabetes were classified as diabetics; 11 of those with no history of diabetes but who had shown sugar in the urine also were so classified.

4. Eight individuals with a hereditary history were classified as potentials. Also, one with familial history and 10 who had sugar in the urine but no history were placed in this group.

5. A total of 20 persons were found to have diabetes; 19 were classified as potentials, three were unclassified, and 70 were normal.

6. All the obese, potential diabetics are reducing, some having lost approximately 40 pounds. All potentials are restricting their diets to some extent.

7. All those having diabetes are under the care of their family physicians.

8. All potential cases will be observed closely for years for development of the disease.

9. There seems to be no difference in the incidence of this disease in the office and laboratory group as compared with those who do varying types of operating and labor in the plant itself.

10. Since our original work was completed a further investigation has been started covering approximately 400 individuals. At this time we can only report that

apparently the occurrence of diabetes is practically the same in the additional group.

11. We realize that the glucose tolerance test is not infallible by any means and that it may lead to false conclusions. However, we have taken every precaution to interpret the results accurately. The figures show a somewhat larger number of diabetics than we anticipated, but it has been our impression for several years that the occurrence of diabetes is greater in this section of the country than has been reported in any investigation of which we have any knowledge.

Conclusions

SUCH a small sampling of the population as 1,800 men and women does not allow too definite conclusions. It does suggest, based on our findings, that the incidence of diabetes may be far greater than has been realized. The incidence in this particular group is about twice what might be expected as compared with published estimates. However, previous estimates of the incidence of diabetes in the country have been based on the known cases only. The known cases of diabetes in this group now include those previously diagnosed and those discovered as a result of this study.

Further investigation along similar lines in other groups even without glucose tolerance tests, but with random blood sugars, would yield very valuable information, and unquestionably would uncover many hitherto unrecognized diabetics.

The greatest benefit resulting from this investigation is not that we may have shown that the actual incidence of diabetes is higher than has been estimated previously. The real value is that we have found a number of individuals, who did not know they had the disease and who now will be able to prolong their lives. Then, too, a goodly percentage of those who are potential cases may be able to avoid the disease because they have been forewarned of the danger.

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AMERICAN ASSOCIATION of INDUSTRIAL PHYSICIANS and SURGEONS

Order of Merit

DR. T. LYLE HAZLETT, Medical Director, Westinghouse Electric and Manufacturing Company, has received the Westinghouse Order of Merit for distinguished service, awarded last month by A. W. ROBERTSON, Chairman of the Board of Directors. The Westinghouse Order of Merit is given in recognition of employees' outstanding contributions to their company's progress. Accompanying each medal is a citation describing the recipient's service. DR. HAZLETT received recognition "for his administrative ability in the field of industrial medicine; for his ingenuity in the organization and promotion of programs of industrial health and plant safety, and for his contributions to education and literature in these fields." DR. HAZLETT graduated from the University of Pittsburgh in 1912, and is a member of Alpha Omega Alpha and Nu Sigma Nu. He served as staff surgeon for the American Red Cross in Russia from 1914 to 1916, and after America entered the war became Lieutenant-Colonel in the Army Medical Corps. He was president of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS, 1941-1942.

T. LYLE HAZLETT, M.D.

Captain Harvey

DR. ANDREW M. HARVEY retired as Crane Co.'s Medical Director a few years ago, writes: "Although I came to California for leisure, I am again engaged in practice. Much to my surprise a request came for me to accept a Commission in the Medical Service of the California State Guard, and so, since June 10, I have been addressed as 'Captain,' and am carrying on as Medical Officer of the 4th California Infantry Regiment, with headquarters in the Armory in Long Beach. This is a full time organization, entrusted with the duty of guarding water works, bridges, docks, in several of the coastal cities in Southern California. I don't doubt but that I am the oldest doctor in uniform and in active service in California, and perhaps in the United States." DR. HARVEY was born in January, 1868; became Medical Director for Crane Co., Chicago, in June, 1896.

CAPTAIN ANDREW HARVEY

Industrial Medicine
Reg. U. S. Pat. Off.

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This Industrial Health

FOR many years the pioneers in industrial medicine and health work have been earnestly advocating the conservation of manpower in industry as a means of obviating the terrible wastage of man-hours. Now comes officialdom representing the War Manpower Commission, the War Department, the Navy Department, the Lend-Lease activities, and the Maritime Commission giving its approval to this principle and urging the cooperation of the Labor-Management Committees in hundreds of plants participating in the war production drive. Thus at long last this objective has the high sanction its medical merits have so long deserved. As an objective to be reached by physicians and surgeons, however, this requires more than the interest and urging of those who are in industrial work; its achievement is impossible without the whole-hearted cooperation of the medical profession. But to what extent is the medical profession prepared at present to assume responsibility of this type, and just where does that responsibility lie? Let us examine the record on these points.

It can be said without fear of contradiction that in spite of all the talk about prevention of illness among industrial employees, the great majority of industrial organizations have limited their services to curative medical and surgical procedures, leaving preventive medicine in industry and specific health programs either undone, or, if considered at all, practiced upon a very limited and unorganized basis. Of course this statement does not apply to the relatively few establishments which have carried on well-planned programs of disease prevention and health promotion for years, some of them for decades—but these are only a small proportion of industrial plants as a whole and thus of the industrial population. The fact is that medical men themselves, as a group, have not been interested to any great extent in applying the principles of disease prevention and health promotion; they still cling rather tenaciously to the practice of curative medicine and surgery in industry.

This state of affairs is not entirely due to the attitude of the medical profession, but represents an interplay of social, economic and medical forces, which have worked together to produce the present status. In the perspective of the historical background, for example, the first compensation laws had little, if any consideration for the health of the worker or for preventive principles, but concerned themselves very largely with the surgical treatment of industrial injuries and compensation for disabilities arising from them. Only very gradually was an interest developed in diseases occurring because of occupational factors, and still more delayed was the slight interest manifested in the control of the causes of occupational disease. And only recently has it been evident that there is any appreciable interest in preventing the great losses which occur because of non-industrial illness. Moreover, the regular courses given in medical schools have not included more than a smattering of the information available with respect to health supervision of the industrial worker—most medical teachers continue to be interested mainly in cure. And the war has served to emphasize these deficiencies in legislation and in medical teaching, the latter of which has been long recognized and is now admitted by the official agencies identified with medical school curricula.

Thus there has always been a shortage of properly trained personnel to render a service of prevention and health promotion in industry. But now the shortage is accentuated because many of those persons who have had adequate training and experience have already gone into the armed forces and others will be required to meet the demands of the service by the end of 1942. This accentuation is taking place while the problem is still, as Woodrow Wilson said, "in the stage of much talk."

And now comes more talk — additional evidence, if any be needed, to support the contentions of the pioneers in industrial medicine that the physical fitness of the industrial worker is the bulwark of production. This, however, has the advantage that it crystallizes the issues and restates the problem so well that it should end the "stage of much talk."

For example, DR. CARL M. PETERSON, writing on the subject "The Physician in Industry,"* says:

"Many factors, social and economic, as well as medical, tend constantly to modify these principal relationships of the physician in industry. There must be suitable adjustment with the employer, the employees, professional aids, like nurses and first-aid men, with consultants, and with official agencies. The unmistakable tendency, however, is to rely on *prevention* as the cardinal principle for reducing lost time and increasing earning power among employees. Further expansion of medical service to industry on any considerable scale will depend squarely upon the ability of the individual practitioner to grasp this concept."

*Medical Clinics of North America, July, 1942. W. B. Saunders Company, Philadelphia.

Regarding the fact that the modern specialty of industrial medicine and health is more than ordinary medical practice, DR. RAYMOND HUSSEY says:*

"Industrial health and medicine require, in addition to training in clinical and preventive medicine, study of the subject content of public health, with especial emphasis on occupational hygiene, biostatistics, and administration."

DR. LYDIA G. GIBERSON, in "A Wartime Survey of Industrial Psychiatry,"* looks forward from her point of view as a psychiatrist to a new field in which

"Finally and perhaps most important, the stimulus of the new information may bring about educational reforms which will produce a new medical entity, a fully implemented professional man who will not be merely a doctor-who-works-in-industry, but an industrial physician."

From research in industrial toxicology, a very necessary and important phase of industrial health and medicine, DR. JOHN H. FOULGER* comments:

"A program of preventive medicine cannot be based on branches of medical science used in diagnosing disease. It must rest upon *physiology* which defines the usual (namely the 'normal') and allows detection of the least departure from that usual. The program cannot be based upon data which describe either lethal or highly injurious dosage as determined in experimental animals. It must rely upon facts which are so general that they apply at least to the majority of chemicals now in use or which may come into use. These facts cannot be deduced from chemical structure or physical properties of materials, new or old, for no general formulae exist which make such deductions possible."

From these and the many similar and related comments currently appearing, the differences between industrial and general practice would seem to be finally, completely, comprehensively and, let us hope, ultimately and permanently set forth. In other words, what is there more to say than has already been satisfactorily said?

Isn't it time, therefore, that the stage of "much talk" begin to be succeeded by the era of more action? There is more action, of course, in the circumstances that doctors who heretofore have had no contacts with industrial medicine are finding such contacts necessary in their daily work. That very fact, however, is the beginning point. What are they going to do about it? Are they going to make their industrial work merely a continuation of their private practice or are they going to acquaint themselves with the problem of the differences, study that problem and seek the solution in terms of the kind of preventive medicine that will have a definite and lasting effect on industrial health? The one will be equivalent to no action at all; the other will be a contribution to the war effort as important as any that can be made in a uniform.

Assuming the latter, how to begin? The answer is in the "much talk" above referred to. The customs and usages of industrial medicine as they have been established are well described in the literature; the practice of industrial medicine, curative and preventive, has long been defined in printed pages. Through resort to these, the general practitioner beginning in industrial medicine can supplement the pragmatism of his approach to a field that will be new to him, and obviate the trial and error methods so long ago outgrown.

*Medical Clinics of North America, July, 1942. W. B. Saunders Company, Philadelphia.

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There is nothing new in "industrial health." The "much talk" about it resolves down to the fundamentals of public health applied to the working population in their work. School health, tuberculosis, sanitation, maternal-mortality reduction and cancer control programs are familiar to all medical men. No uprooting of traditions is needed to adapt the same principles to industry; only a change of habit. The basis of the adaptation is medical, and the fact of the presently accentuated shortage of men trained in industrial medicine does not make it less medical.

It is thus, for the time of the emergency at least, the problem of the private practitioner; he must do the adapting. And he can do it *now*, while the need is great, by quickly opening his mind to the differences, the larger views, the amplified techniques and the broader community and social relations inherent in the industrial setting. If all that is known and available to be learned in respect of industrial medicine were to be suddenly applied by the medical profession at large to the industrial population as a whole there would be an immediate and satisfactory reflection in less industrial ill-health, and a later and satisfactorily permanent suspension of the "much talk" about socialized medicine.

And thus it is that, although the present state of affairs "is not entirely due to the attitude of the medical profession," its continuance from now on will be.

Industrial Health in Georgia

THE Industrial Hygiene Service of the State Health Department was organized last year. In collaboration with the Industrial Health Committee of the Medical Association of Georgia, it is prepared to offer specialized service in the diagnosis and control of illness in industry. Personnel have been employed who are qualified in the special fields of medicine, nursing, engineering, and chemistry. An industrial hygiene laboratory has been outfitted in the State Office Building, with the finest equipment available. Samples of some of the field equipment for air-measurements, dust counts, and combustible gas determinations are on display at our exhibit booth at this meeting. A reference library with a trained librarian has been started and standard texts, periodicals, and reprints on all phases of industrial hygiene are being collected.

The Industrial Hygiene Service brings to industry all the facilities of the Health Department for the control of all preventable illnesses, whether of occupational or non-occupational origin. Included are the divisions of Preventable Diseases, Tuberculosis Control, Venereal Disease Control, Malaria and Hookworm Service, Maternal and Child Health, Public Health Engineering, Public Health Nursing, Public Health Education, Local Health Organizations, Vital Statistics, and the Laboratory.

AN EXAMPLE of the extent and effectiveness of these services was illustrated in a recent explosive water-borne epidemic of typhoid fever and dysentery in a Georgia cotton mill. There were 80 primary cases of typhoid and 79 cases of bacillary dysentery. The State Health Department supplied four doctors, seven nurses, and two engineers. Over 1,200 laboratory examinations were made. The epidemic was promptly controlled. There have been no secondary cases, although without active control measures the danger of food, milk, or fly-borne secondary cases is great. Twenty carriers of typhoid are still under observation. Every case of typhoid reported anywhere in Georgia this year has been investigated to determine any possible connection with this outbreak. Hundreds of potential secondary cases have been prevented. However, the four deaths and the many hundreds of man-days of disability and suffering should be a lesson to us all, for all of this could have been prevented.

—From "Industrial Health in Georgia," by L. M. PETRIE, M.D., Director, Industrial Hygiene Service, Division of Preventable Diseases, Georgia Department of Public Health; read before the Medical Association of Georgia, Augusta, April 29, 1942; published in *J. M. A. Georgia*, July, 1942.

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NEW BOOKS

THE July, 1942, number of "Medical Clinics of North America," published by W. B. Saunders Company, Philadelphia, is devoted entirely to a symposium on industrial medicine. Nineteen contributors have written papers in their respective fields of industrial medicine, presenting material which covers some of the most important aspects, and thus producing a volume which is particularly important at this time in view of our war production activities.

The material represents a post-graduate or "refresher" course, not only for the industrial physicians and surgeons who are now engaged, but also for those private practi-

"Symposium on Industrial Medicine"

1. *"Introduction,"* CLARENCE D. SELBY, M.D., F.A.C.S., Medical Consultant, General Motors Corporation, Detroit.
2. *"The Physician in Industry,"* CARL M. PETERSON, M.D., Secretary, Council on Industrial Health, American Medical Association, Chicago.
3. *"Organization and Management of an Industrial Medical Service,"* A. L. BROOKS, M.D., Medical Director, Fisher Body Division, General Motors Corporation, Detroit.
4. *"Physical Examinations in Industry,"* GRANT L. BIRD, M.D., F.A.C.S., Medical Director, General Motors of Canada, Ltd., Oshawa, Ontario, Canada.
5. *"Workmen's Compensation and Medicine,"* RAYMOND HUSSEY, M.D., F.A.C.P., Chairman, Medical Board for Occupational Diseases, Baltimore, Maryland; Associate Professor of Medicine, University of Maryland School of Medicine; Instructor in Medicine, Johns Hopkins University School of Medicine; Attending Physician, University Hospital; Physician-in-Chief, St. Joseph's Hospital.
6. *"Tuberculosis as a Compensation Problem,"* C. O. SAPPINGTON, M.D., DR. P.H., Consultant, Chicago.
7. *"Nutrition in Industry,"* WILLIAM A. SAWYER, M.D., Medical Director, Eastman Kodak Company, Rochester, N. Y.
8. *"A Wartime Survey of Industrial Psychiatry,"* LYDIA G. GIBERSON, M.D., Metropolitan Life Insurance Company, New York.
9. *"The Measurement of Sickness among Industrial Workers,"* WILLIAM M. GAFAFER, D. SC., Senior Statistician, U. S. Public Health Service, and Chief of the Statistical Unit, Division of Industrial Hygiene, National Institute of Health, Bethesda, Maryland.
10. *"Fatigue and War Production,"* ROBERT H. FLINN, M.D., Past Assistant Surgeon, U. S. Public Health Service, Division of Industrial Hygiene, National Institute of Health, Bethesda, Maryland.
11. *"Prevention of Ill Health in Industry,"* JOHN H. FOULGER, M.D., PH.D., F.A.C.P., Haskell Laboratory of Industrial Toxicology, Wilmington, Delaware; Associate Professor of Industrial Health, Medical College of Virginia, Richmond.
12. *"Methods Employed in the Appraisal and Control of Industrial Health Hazards,"* J. J. BLOOMFIELD, Sanitary Engineer, U. S. Public Health Service and Chief, States' Relations Section, Division of Industrial Hygiene, National Institute of Health, Bethesda, Maryland.
13. *"Indoor Environmental Atmosphere and Its Control,"* WM. JOHN MCCONNELL, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York.
14. *"Protective Ointments and Industrial Cleaners,"* LOUIS SCHWARTZ, M.D., Medical Director, U. S. Public Health Service, and Chief, Dermatoses Investigation Section, Division of Industrial Hygiene, National Institute of Health.
15. *"Effects of High Pressures; Prevention and Treatment of Compressed Air Illness,"* ALBERT R. BEHNKE, JR., M.D., Lieutenant-Commander, Medical Corps, United States Navy.
16. *"The Pneumoconioses,"* LEROY U. GARDNER, M.D., Director, Saranac Laboratory for the Study of Tuberculosis of the Edward L. Trudeau Foundation, Saranac Lake, New York.
17. *"Lead Absorption and Lead Poisoning,"* ROBERT A. KEHOE, M.D., Research Professor, Kettering Laboratory of Applied Physiology, University of Cincinnati College of Medicine, Cincinnati.
18. *"The Toxic Properties of Selected Less Familiar Metals,"* CAREY P. MCCORD, M.D., Medical Department, Chrysler Corporation, and JOHN J. PRENDERGAST, M.D., Medical Department, Chrysler Corporation, Detroit.
19. *"Recent Progress in Aviation Medicine,"* BENJAMIN F. JONES, M.D., Past Assistant Surgeon, Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Maryland.

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*R. H. Aldrich, M.D.: Jl. Maine Med. Assn., 33:21-30, February, 1942.
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tioners who find it necessary to do industrial work either on a part-time or full-time basis.

Pertinent Highlights

THE subjects in this "Symposium on Industrial Medicine" are so important and timely, and the method of treating the material is of such vital interest, that brief abstracts of each subject and the method of its presentation will afford a clearer picture, than the reviewer's comment.

THE PHYSICIAN IN INDUSTRY (Peterson): This subject includes a consideration of medical and surgical care, preventive industrial medicine, health conservation, and other relationships. Especial emphasis is placed on sound organization of medical services in industry, the necessity for physicians understanding the standards of professional competence, the principles of prevention and health conservation.

ORGANIZATION AND MANAGEMENT OF AN INDUSTRIAL MEDICAL SERVICE (Brooks): This is a resume of medical activities of the Fisher Body Division of the General Motors Corporation since World War I. Subheadings included in this article are Nature of Manufacturing Processes, Personnel of an Industrial Medical Service, Quarters and Equipment, Operation of the Medical Department, including the details which are supplemented by illustrations.

PHYSICAL EXAMINATIONS IN INDUSTRY (Bird): This paper condenses the experiences in the medical department of General Motors of Canada, Ltd. The subjects treated are Pre-employment Physical Examinations (benefits, methods, forms, standards), Periodic Physical Examinations, Post-sickness Physical Examinations. The results of some 23,000 examinations are compared in the statistical data presented.

WORKMEN'S COMPENSATION AND MEDICINE (Hussey): The development of workmen's compensation is outlined, together with material on the Administration of Compensation Laws, Compensation Insurance, Control and Prevention of Disease, with a discussion of Medicolegal Relationships and the Position of Medicine in the Workmen's Compensation Program. Especially apropos is the statement: "Industrial health and medicine require, in addition to training in clinical and preventive medicine, study of the subject content of public health with special emphasis on occupational hygiene, biostatistics, and administration."

TUBERCULOSIS AS A COMPENSATION PROBLEM (Sappington): This discussion is limited to pulmonary tuberculosis, particularly with relationship to factors in the industrial environment, excluding trauma, and considers the Medical and Industrial Hygiene Aspects and Medicolegal Phases, the latter of which are divided into Medical and Legal Problems. The author places especial emphasis on the necessity for establishing specific etiology, the use of accepted diagnostic standards, the practical application of methods of rating disability and criteria for return to work, the importance of case-finding in industry, and the social problems encountered in treatment, rehabilitation, and vocational education.

NUTRITION IN INDUSTRY (Sawyer): Nutrition and Defense, The Worker's Diet, Specific Deficiencies, Vitamin Supplements, Between-Meal Feedings in Industry, and an Outline of a Nutritional Program in Industry are treated in this paper. A dietary questionnaire is included with tabular material with reference to daily allowances recommended by the Committee on Food and Nutrition, National Research Council. Source material for health educational activities in nutrition programs is given. Existing nutritional deficiencies are pointed out and remedies given.

A WARTIME SURVEY OF INDUSTRIAL PSYCHIATRY (Giberson): The author reviews the experience in World War I, including the subjects of Post-War Psychiatry, Preventive Psychiatry, Industrial Preventive Psychiatry, the Industrial Worker's Problem. The new socio-medical synthesis is presented with detailed description of present-day facilities for studying workers' problems, and the role of the industrial physician. Application of psychiatric principles to industry embraces specific recommendations for the physician in industry. Differentiation is made between a "doctor-who-works-in-industry" and an industrial physician.

THE MEASUREMENT OF SICKNESS AMONG INDUSTRIAL WORKERS (Gafafer): The immense losses due to sickness of industrial workers makes this subject a vital one in our industrial economy. Sickness Absenteeism Rates, Compar-

—Continued on page 406

INDUSTRIAL HEALTH and DISEASE

Predisposition to Occupational Skin Disease

JOHN N. GALLIVAN, M.D.,
Chief Medical Officer, United Air Craft,
East Hartford, Connecticut

MUCH has been written about occupational dermatoses, that group of skin disorders arising in the course of employment and outnumbering all other occupational diseases by better than two to one. In this short article, I shall not attempt to discuss all phases of the subject, but I do wish briefly to present a sort of "classification of skins," which has proved helpful to me as a guide in pre-employment examinations. No claim is made for completeness, accuracy, nor originality. Reading, discussions, and experience have produced the list, which is constantly being enlarged and modified.

In "Industrial Doctors' Exchange," *Connecticut Industry*, July, 1942.

It should be borne in mind that this classification is used in an aircraft industry, and is not intended to cover all types of occupations. Although aware of the statement by eminent authors that in occupations presenting skin hazards, all applicants should be carefully examined and patch-tested with the materials with which they are to work, we are faced in our industry with two major obstacles to this program: (1) in our largest plants, over 90% of the jobs present a skin hazard; and (2) the present rush of employment allows little time for patch-testing. We have instead used the "classification" presented here, and our success in reducing the incidence of occupational dermatoses by following this guide has been appreciable.

We classify all occupational dermatoses into two main groups: (1) folliculitis—that rash characterized by comedones, papules, pimples, pustules and "oil boils" occurring as the result of plugging of the hair follicles on exposed surfaces; and (2) eczematoid—that rash characterized by erythemas, urticarias, vesicles, scaling, weeping, cracking, roughening or itching. We think of folliculitis as resulting from mechanical plugging of the pores with the industrial contact followed by secondary infection; and we think of the eczematoid group as manifestations of allergic or hypersensitivity tendencies.

Young men with dark, thick, oily, hairy skin, particularly if comedones or acne are present, are prone to develop folliculitis; whereas men and women with light (blondes and "redheads") thin, dry, smooth skin are prone to develop eczematoid rashes.

Petroleum oils, greases, waxes, paraffin and the like produce the folliculitis in the oily, dark-skinned group; whereas the dry, smooth-skinned group do better. Soaps, turpentine, naphtha, gasoline, benzol, carbon tetrachloride, trichlorethylene, tetrazine, toluol, resins, coning oils, and other alkalies, petroleum distillates, and coal-tar distillates commonly produce eczematoid dermatitis in the blonde, dry, thin-skinned group; whereas the dark, thick, oily skins do better. These two major skin types are fundamental and should be kept in mind while following the classification outlined below. In the outline below, the words "dry job" mean a job free from all skin irritants of all types whether liquid, solid or gas.

Acne—Slight acne, particularly if limited to face, back, and chest acceptable, but in moderate and severe cases especially with forearm involvement, avoid petroleum oils, greases, waxes, paraffin and the like.

Age—In general, the younger the applicant, the greater the hazard. However, older employees who have built up a sensitivity or have a chronic eczema are dangerous.

Arsenic—Applicants who are being treated with arsenic or who have had a long course of arsenic treatment are apt to develop severe dermatitis with almost all skin irritants. Put on a "dry job."

Blondes—Avoid alkalies, soaps, gasoline, turpentine, and the other petroleum and coal-tar distillates listed in the major group above. Also avoid sunlight, electric welding (without complete covering), painting and outdoor or roofing work, which may lead to overexposure to sunlight. "Redheads" belong in this group.

Cleanliness—Applicants who on examination show dirty bodies and dirty clothes won't observe hygiene rules any better if employed. Especially if they have comedones or acne, which is slight and might pass otherwise, keep these unhygienic ones out of petroleum oils, greases and waxes.

Diabetes—Avoid petroleum oils, greases and waxes, but especially avoid jobs where sharp chips in the oils are liable to cause small cuts and abrasions.

Drug eruptions—"Dry job" until fully recovered. Then avoid coal-tar and petroleum distillates; especially avoid phenol and benzol compounds. Since future eruptions may be basis of claim as occupational dermatitis (the differential diagnosis is often difficult), it is wiser to avoid all skin irritants; that is, put on a "dry job."

Dryness—Avoid fat solvents such as trichlorethylene, carbon tetrachloride, gasoline, as well as alkalies, petroleum distillates, coal tar distillates, resins, soaps. Also, especially in older applicants with poor general make-up and defective circulation, avoid coldness, dampness and abrupt temperature changes.

Ecthyma—A definite hazard. If slight and unexposed, may have "dry job." If exposed or more severe, reject until fully recovered. No hazard after full recovery.

Eczemas—A history of eczema, from any cause at all, should mean a "dry job" only. Especially is this true in middle aged and older men who have a chronic eczema from occupational contact.

Erysipeloids—Reject until fully recovered.

Exposure—If an applicant has had long experience working in contact with certain irritants without difficulty, even if his skin type is such that ordinarily he would be excluded from contacts with those irritants, accept him. Especially is this true if he had difficulties at first and then "hardened" so that daily contact caused no trouble. These "hardened" older workers are much safer than applicants new to the particular contact.

Flat feet—Avoid long-standing or walking. Corns, callouses, maceration from friction are annoying complications.

Furunculosis—"Dry job" only until brought under control. Then avoid petroleum oils, greases, waxes and paraffin.

Grain itches—"Dry job" until fully recovered. Especially avoid alkalies, soaps, coal tar and petroleum distillates.

Hairy skins—Avoid cement, waxes, greases, petroleum oils.

Hyperidrosis — (Excessive perspiration.) Avoid very dusty work (propeller grinding, etc.), rust preventives, cement, hot metal work, soda solutions, hydrolizers, furnaces, jobs with large amount of friction. (Incidentally, keep off inspection work since the perspiration, in excess of what lanolin can absorb, will corrode the metals.)

Hypersensitivity — A history of frequent plant rashes (such as those who annually have poison ivy rashes), rashes from industrial contacts, food or drug rashes, eczemas or urticarias, and similar evidences of allergic tendencies, should exclude the man especially from contacts with coal tar distillates and the other contacts listed in the general "blond, dry, thin-skinned" group above. A history of asthma or hay-fever, however, may be discarded as unimportant from the skin standpoint.

Ichthyosis—Avoid the contacts listed above under "dryness." Also avoid excessive friction and pressure since dark disfiguring callosities may result.

Impetigo — Reject until fully recovered. Then temporarily avoid skin irritants until all scars have whitened.

Intertrigo—(Chafing due to excessive perspiration and friction)—A guide to the hyperidrosis group (see above) when examinations are done in cool rooms. Avoid furnaces, heat treat work, hot vats, etc.

Keratosis pilaris—(Rough dry skin with a pinpoint eruption at neck and shoulders from irritation of garments)—"dry job" only. Avoid all skin irritants.

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Lichen planus—Probably not a hazard; but cause is unknown and aggravation of the rash by skin irritants cannot be disproved. It is wiser, therefore, to place these applicants on "dry jobs."

Lupus—Avoid all skin irritants. Especially avoid roofing or outdoor work, where excessive sunlight may be encountered. Avoid electric welding and painting.

Mycotic infections—As a group, these are the most troublesome of all skins. The development of a rash on the hands or other parts, as a result of aggravation by industrial contacts, is common and is difficult to treat. Many of these "phytid" developments are probably the result of a sensitization of the individual from a focus of infection such as "athlete's foot" and probably would have developed without any industrial contact. This can't be proved, however, and even if it could, the aggravation of the "phytid" rash itself by industrial skin irritants couldn't be disproved. Epidermophytosis pedis ("athlete's foot"), epidermophytosis inguinale ("dhobie itch"), Tinea cruris ("crotch itch"), Tinea circinata ("body ringworm") and other such infections caused by trichophytons, microsporons, or blastomycetes must be minimal if any exposure to skin irritants is to be permitted. Slight infections, far away from possible exposed surfaces, may be accepted and treatment instituted immediately. More severe infections or those on exposed surfaces must be put on a "dry job" until recovery is complete, and time enough allowed so that recurrences are a remote possibility. Both groups of irritants, those commonly producing folliculitis and those commonly producing eczemas, are equally dangerous in these mycotic infections.

Negroes—Generally very tolerant of irritating dusts, dyes, solvents, acids and the others in the "eczema-producing group"; and are preferable to any group on these. Avoid aniline compounds, and also jobs where burns, cuts, "chip trauma" and other sources of multiple minor traumata are prevalent to avoid danger of "keloids."

Oily skins—An asset when contacting turpentine, gasoline, trichlorethylene, and other fat solvents and "degreasers." Avoid petroleum oils, greases and waxes. With good hygiene practiced, these are "safe" workers.

Paronychia — Chronic paronychia sufferers should have a "dry job" only.

Phytids—If already present, "dry job" only. See "mycotic infections" above.

Pityriasis rosea (also rubra, versicolor)—The pityriasis group may possibly be aggravated by industrial skin irritants and when encountered in the pre-employment examination, should call for holding the applicant until full recovery occurs. Both the folliculitis-producing and the eczema-producing contacts are hazardous. After full recovery, no restrictions are necessary.

Plant rashes—If a frequent occurrence, "dry job" only. If present at examination and represent a single attack, may accept after fully recovered. (See "hypersensitivity" above.)

Psoriasis—In our experience, not a hazard. In fact, contact with skin irritants has produced improvement in certain cases of psoriasis.

Scabies—Hold out of shop until full recovery has taken place and all sores and excoriations have completely healed. Secondary infection of scratched areas is a possibility unless completely healed.

Seborrhea—Avoid petroleum oils, greases and waxes even if the case is slight. More severe cases should have "dry job" only.

Sunburn—Avoid all skin irritants except greases, waxes and paraffin until acute burn has subsided.

Syphilis — Primary and secondary rashes need not be considered here since the infected applicant would be a hazard from the contagion standpoint, and would be rejected anyway. Non-contagious syphilitics, who are accepted, are put on "dry job." See "Arsenic" above.

Telangiectasis—Avoid excessive heat such as heat treat furnaces, hot vats, etc.

Tinea circinata and tinea cruris—See "Mycotic infections" above.

Varicosities—Avoid prolonged standing. Eczemas, trophic changes, maceration, and ulceration, are the dangers. Avoid jobs where trauma to the feet and legs occur; even minor traumata produce ulcerations frequently.

I repeat that this classification is used in an aircraft industry and is not intended to cover all types of occupations nor all types of skins and skin diseases. It is merely a helpful guide to us in classifying "skins" in pre-employment examinations. I shall welcome suggestions and criticisms.

Continued from page 28—

ness undertook a fact-finding survey to determine the extent to which measures are being adopted for conservation of sight in industrial plants. The summary of findings from industries reached so far, small in number but representing some of the large, well-organized companies in the United States, shows that, while conditions relating to general safety are quite fine in their provision for medical supervision, first aid and nursing service, protective equipment and general education, provisions relating specifically to eye health are far from adequate. We can be quite sure that conditions in smaller plants throughout the country are much less favorable and that in them eye health receives, proportionately, even less emphasis.

—From "A View of Prevention of Blindness in Relation to Public Health," by ELEANOR BROWN MERRILL, in *Sight-Saving Rev.*, June, 1942.